

Some Pennsylvania Pioneers
in
Agricultural Science

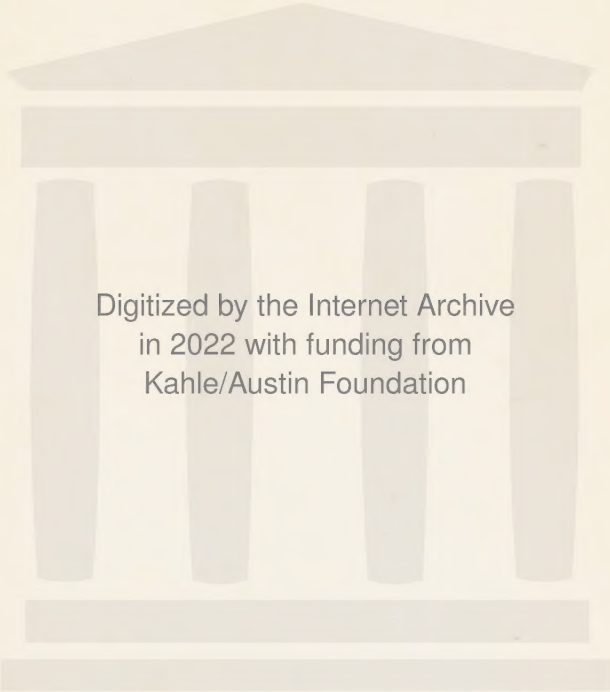
THOMAS I. MAIRS

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THE COLLEGE FROM EAST BEAVER AVENUE, ABOUT 1895

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SOME PENNSYLVANIA PIONEERS

IN

AGRICULTURAL SCIENCE

By

THOMAS I. MAIRS

PROFESSOR IN THE PENNSYLVANIA STATE COLLEGE
SCHOOL OF AGRICULTURE

THE PENNSYLVANIA STATE COLLEGE STUDIES
IN AGRICULTURE, NO. 1.
COLLEGE SERIES NO. 2

STATE COLLEGE, PA.

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BY
THOMAS I. MAIRS

To

ROBERT H. GARRAHAN

Horticulturist and Patron of Agriculture
who has made possible the publication
of these Sketches

35644

PREFACE

THESE sketches have been written to put into available form information concerning some of the men who laid the foundation of the School of Agriculture and the Agricultural Experiment Station of The Pennsylvania State College. They were prepared upon the suggestion of Dean Ralph L. Watts who should receive the credit for their inception.

The aim of the writing has been to show something of the personal characteristics of the men as well as the part each took in the development of the agricultural activities of the institution. It has not been intended to write either a history of the School of Agriculture or complete biographies of the persons considered.

In any collection of sketches the problem of determining the basis of selection raises many questions. Why were these eleven men selected and others omitted? In answer it may be said that it was impossible to include all who have had a part in the making of the institution. Those included were either with the Experiment Station from its beginning and remained long enough to make a distinct contribution to its policy and progress, or they had been connected with the College earlier in such a way as to add sensibly to its growth. The selection has included only those who may be regarded as outstanding individuals,

prior to the coming of Dr. Thomas F. Hunt as Dean and Director in 1907.

In the preparation of each article, members of the family (of the man) have been consulted. College records and contemporary acquaintances have also been sources of information. We take this occasion to thank all those who have contributed to the preparation of the work.

THOMAS I. MAIRS.

State College, Pennsylvania.

April 23, 1928.

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I

INTRODUCTION

THE School of Agriculture of The Pennsylvania State College is the only institution of higher learning for the promotion of agriculture in the Commonwealth. Since agriculture is the basic industry of our country, it seems particularly appropriate that we endeavor to perpetuate the memory of the men who helped found this state institution.

With the exception of William G. Waring, it was my great privilege to have an intimate acquaintance with the members of the faculty whose life sketches are presented briefly in this volume. How well these educators built the foundation for a great superstructure in agricultural education, history will reveal. As a student at The Pennsylvania State College, I cherish their memory. Later, as an associate in the work of the institution, I observed that the entire College community recognized the high order of their professional services and their admirable personal traits.

The personnel of a college community changes rapidly. It is doubtful whether there is a student at the College now who was here when Dr. William Frear died in 1922. In fact, many of the more recent members of the faculty of the School of Agriculture did not know any of the scientists herein mentioned. In order that the great work of these foundation

builders may not be forgotten, the preparation and publication of their biographies was suggested.

Professor Thomas I. Mairs, the author of these Memoirs, is well known among agricultural educators. He has been a highly esteemed member of the faculty of The Pennsylvania State College for twenty-seven years, and his close personal acquaintance with all except two of the eight men included in the volume made him especially well qualified to write the sketches. It has been a work of love, undertaken with great care over a period of about five years. I am confident that the friends of agricultural education, including the students and faculty of this institution at the present time and for future generations, will increasingly appreciate the splendid service rendered by the author.

It seems especially fitting that Robert H. Garrahan, a prominent horticulturist of Kingston, Pennsylvania, should, through his financial generosity, make possible the publication of the sketches. As a student at the College he became well acquainted with nearly all the educators whose biographies are presented here, and he always has been a staunch friend of agriculture and of The Pennsylvania State College.

RALPH L. WATTS,

*Dean of the School of Agriculture;
Director of the Agricultural Experiment Station.*



HENRY PRENTISS ARMSBY

ALLEGHENY CO. 11

II

HENRY PRENTISS ARMSBY

September 21, 1853

October 19, 1921

WHEN the Hatch Act was passed in 1887, establishing an Agricultural Experiment Station in each state, the problem of finding suitable and qualified men with the kind of training and experience needed became acute. This was particularly true concerning the selection of the directors. There were men well qualified in pure science, but who had little executive ability, no agricultural experience, and little, if any, conception of agricultural problems. There were others, successful farmers, sometimes with executive ability but with no knowledge of general science as a foundation. Others had made reputations as agricultural writers and editors of farm papers; but their ability often consisted chiefly of skill in putting out an interesting story. All these classes were drawn upon by those having the control of the stations. The problem was further complicated by the fact that "lame ducks" and political party workers, like the poor, we always have with us; and their friends feel that they must be taken care of. It is no wonder then that the institutions were called in some states "Experimental" Stations rather than Experiment Stations.

Fortunate indeed was the station that was able to secure for Director the services of a man of broad training with a grasp of farm problems, with a keen vision, and who was imbued with the spirit of science—one who would be looked to as a leader on account of his qualities of mind and character.

Few, if any, of the states were so favored as Pennsylvania in the choice of their Directors. The President and Trustees of the College acted more wisely than they knew when they selected Dr. Armsby to organize and administer the Pennsylvania experiment station.

Henry Prentiss Armsby was the only child of Lewis and Mary A. (Prentiss) Armsby and was born at Whitinsville, Worcester County, Massachusetts, September 21, 1853. His father, an expert cabinet maker, was a native of Sutton, Massachusetts, and his mother of Northbridge. When he was still a small boy the family moved from Whitinsville to Millbury, Massachusetts, probably because the latter place offered a better field for the father's trade.

Henry attended the common schools of Whitinsville and Millbury and from a child was interested in chemical experiments. He entered the Worcester County Free Institute of Industrial Science, which later became the Worcester Polytechnic Institute, at the age of fifteen and was graduated three years later with the first graduating class, receiving the degree of Bachelor of Science in the course in pure chemistry. After graduation he remained at the Institute one year as assistant in chemistry and then entered the

Sheffield Scientific School of Yale University for graduate work.

He received the degree of Bachelor of Philosophy from Yale in 1874 and in the same year presented his first research paper. It was entitled "The Decay of Organic Nitrogenous Substances" and was read before the meeting of the American Association of Agricultural Colleges and Experiment Stations, held at Hartford, Connecticut. During the next year, 1874-75, he taught science in the high school at Fitchburg, Massachusetts.

It was probably while at Yale that Armsby's thoughts were first turned toward agricultural problems for there he came in contact with Dr. Samuel W. Johnson, Professor of Agricultural Chemistry, and leading investigator of his day in that field in America. It was under Dr. Johnson that his own investigations began. It was also while at Yale that he formed the friendship with Edward H. Jenkins who later became Dr. Johnson's successor as Director of the Connecticut Experiment Station.

In 1875 Armsby went abroad for study, accompanied by Jenkins, and entered the University of Leipzig, Germany. Here he put in a year of study and continued his researches under some of the foremost German chemists. Here he also came in contact with the work of Gustav Kuhn of the Experiment Station at Mockern. Armsby seems to have been particularly impressed with the investigations in animal nutrition and the digestion experiments with respiration apparatus. His studies at Leipzig resulted

in the publication of two scientific papers in the German language, one after his return to America. The year following his return to this country, 1876-77, he taught chemistry in Rutgers College, New Brunswick, New Jersey.

In 1875 the first Agricultural Experiment Station in the United States was organized in Connecticut, largely through the influence of Dr. Johnson, with W. O. Atwater its first director. Upon Dr. Johnson's recommendation young Armsby was elected chemist of that Station when it was removed from Middletown to New Haven, and Dr. Johnson was made director in 1877. It was while here that he began a translation of Wolff's *Landwirthschaftliche Fütterungslehre*, the standard German work on feeding with which he had become quite familiar. His recognition of the lack and need of such a work in English induced him, at the suggestion of Dr. Johnson, to undertake its translation. He had not proceeded far until, as he says, he found so many changes and additions were necessary to adapt it to American conditions that it became practically a new book, and the *Manual of Cattle Feeding* was issued in 1880. It is the standard work on the subject in the English language and marks the beginning of his active interest in animal nutrition. It was while he was in New Haven, also, that the degree of Doctor of Philosophy was conferred upon him by Yale University in 1879.

Of his methods of study at that time, Dr. Jenkins says:

“He was a **thinker**. I remember vividly on winter

nights—we were rooming together—he would sit with his feet to the fire, not drowsing or dreaming, but thinking hard. And then he would go to his desk and write awhile and then come back to think.

“The details of our analytical work interested him less than the physiological problems to which he devoted himself later.”

From 1881 to 1883 Dr. Armsby was Vice-Principal and Professor of Agricultural Chemistry in the Storrs Agricultural School, now the Connecticut Agricultural College at Storrs, Connecticut. It was while here that in conjunction with E. H. Jenkins the *Farmers' Annual Handbook* was issued. Apparently he did not consider the Storrs school at that time of much worth for in mentioning the name of a later president of the Connecticut Agricultural College to the writer he said this man had been “able to do something no one else had ever done, find a use for the school.”

In 1883 he was elected Professor of Agricultural Chemistry and Associate Director and Chemist of the newly established Experiment Station at the University of Wisconsin where he remained until called to the Directorship of the new Agricultural Experiment Station of The Pennsylvania State College, in 1887.

Dr. Armsby brought to The Pennsylvania State College a training for his new position equalled by few men in America at the time and probably excelled by none. This training added to his naturally keen mind, high standards, and zeal for hard work,

soon placed him in an outstanding position among the experiment station directors of the country.

He had been married to Miss Lucy A. Harding of Worcester, Massachusetts, October 15, 1878. Mrs. Armsby's culture and high ideals did much to advance the social life of the straggling country community, then a small village of less than one hundred inhabitants. She was particularly active in making new members of the staff, and especially their wives, feel at home. The five Armsby sons were graduated from The Pennsylvania State College.

Dr. Armsby came to the Pennsylvania Agricultural Experiment Station in the vigor of early manhood with a wealth of training and experience which possibly had come to no other young American chemist at that time. He had taught high school and college students at his Alma Mater, in Fitchburg, Massachusetts, in the Storrs Agricultural School, in Rutgers College, and in the University of Wisconsin. He had studied three years as a graduate in the Sheffield Scientific School under Dr. Samuel W. Johnson and others, and had spent a year abroad under German chemists. He had conducted investigations as a graduate student at Yale and at Leipzig and later as a member of the Experiment Station staff in Connecticut and in Wisconsin. In the former state he had associated with Dr. Johnson and Dr. Jenkins, while in the latter he had as co-laborers Dr. Henry and Dr. Babcock. In Wisconsin he had organized and carried out a number of tests on various agricultural problems and started the digestion experiments which were to

contribute so largely in the development of his life work. He had published several scientific articles which were noted for the clearness and accuracy of their statements.

The Hatch Act was approved and signed by President Cleveland, March 2, 1887. On June 30 of the same year, the Trustees of The Pennsylvania State College took action accepting the provisions of the act and establishing the Experiment Station at The Pennsylvania State College and transferred to it the work and equipment of the Central Experimental Farm. At that time H. P. Armsby, Ph.D., was elected Director with the following staff: Vice-Director and Chemist, William Frear, Ph.D.; Botanist, William A. Buckhout, M.S.; Horticulturist, George C. Butz, B.S.; Superintendent of Farm, William C. Patterson; Laboratory Assistant, Harry J. Patterson, B.S.

Dr. Armsby accepted the position October 1, 1887, but he did not reach the College until near January 1, 1888. With the staff which had been selected for him he continued the work in Pennsylvania which had already been laid out and started largely by Dr. Jordan and Dr. Frear. It is interesting to note that with the exception of Harry J. Patterson, who later became Director of the Maryland Experiment Station, all the members of the original staff remained with the College until their death.

The laboratories and offices of administration of the Experiment Station were at first housed in the main college building. The inconvenience of this situation was immediately apparent and steps were at once

taken for the erection of an office and laboratory building which was authorized by the Trustees to be erected at a cost not to exceed \$15,000, voted January 24, 1888. "After consultation with other officers of the Station and the inspection of the new building of the Massachusetts State Experiment Station, a plan was submitted to the building committee and adopted without any material change." The cornerstone of the building was laid with a celebration June 27, 1888. During the first year two assistants and a stenographer were added to the original staff.

In the announcement which was issued as Bulletin No. 1 of The Pennsylvania State College Agricultural Experiment Station Dr. Armsby says in regard to the experimental work that had already been done: "The experimental work in agriculture which has been carried out by the College since its foundation will be continued and greatly enlarged under this form of organization." He says further: "It will be the aim of the Station to select for study such of these problems as appear to be of most immediate practical importance to the farmers, stock raisers, and fruit growers of the State, to bring all possible scientific appliances to bear on their solution, and by publishing the results of the investigations to make the knowledge thus obtained the common property of all. It will seek to do thorough, conscientious work; to do a few things well, rather than many superficially." This policy he tried to carry out through his entire administration.

The Station undertook the gratuitous examination

of samples of agricultural and horticultural products sent in by citizens. The first bulletin contained an article giving instructions for taking and sending samples. There were particularly mentioned samples of feeding stuffs, milk, butter and cheese, seeds, soil and muck, and commercial fertilizers. There were also directions for preparing and sending in samples of plants, grasses, weeds, etc., for identification.

This first bulletin contained, too, a historical sketch of the experimental work previously done by the College and an account of the soil and crop experiments of Dr. Frear.

Dr. Armsby realized the impossibility of doing everything that was expected of the Station. There were insistent demands for tests of diverse kinds, very elementary work which could easily be performed by anyone who would take the trouble to make measurements and which should not involve the time of trained scientists.

In his first report to the President of the College he says: "The Station proposes to undertake in the interest of the farmers of the State essentially three kinds of work:

"First. It will plan and carry out experiments designed further to add to our knowledge of the principles accepted in the successful production of crops and animals and to show the best methods of applying in practice the principles already established.

"Second. In addition to the work of general interest to all farmers, questions often arise of particu-

lar interest to one or a few farmers, such as the value of some new kind of fodder, the purity and germination power of a lot of seed offered or purchased, the name and value of a new grass or other plant, the name and habits of a new insect, etc., etc. The station will endeavor to the extent of its power to aid farmers by examining samples sent to it, identifying plants and insects, testing seeds, etc.....on the other hand, the station cannot undertake private work and will not make any examinations, the results of which it is not at liberty to publish or otherwise use at its discretion for the public good.

“*Third.* The station will aim to make itself useful as a bureau of information on agricultural matters for farmers and others interested in its work and will, to the extent of its ability, answer any inquiries pertaining to agriculture or horticulture.” In the report for 1889 the author emphasizes the importance of increased livestock production in Pennsylvania in order to maintain the fertility of the soil.

In a later statement he says, “I consider that the work of an experiment station should be twofold in character. First, the station should conduct investigations into the principles underlying the successful practice of agriculture. Work of this kind should be strictly scientific in plan and execution. Second, the station should make a design to show how the general principles of information already thus discovered, and by the kind of investigation first maintained, can be possibly applied in practice.....What proportion of the full energy and means of a station should be given

to these two classes of experiments is a question requiring careful consideration." He then gives a rather full outline of the kind of experiments he proposes to have carried on.

In the report for 1891 he explains what an experiment station farm should be. He says: "The idea still more or less distinctly prevails that it should be what is often called a 'Model Farm,' where can be seen the best varieties of farm crops, the most approved methods, the largest crops, the finest buildings, the best stock of all breeds, etc.

"Still another conception of the experiment station farm is that of a farm conducted according to the most approved scientific methods and having for its object the securing of exceptionally large profits.

"Both these ideas are of value and a farm conducted upon either plan would be, to a certain extent, an experiment in itself; but they are foreign to the idea of an experiment station. A model farm would involve a large first cost for buildings, stock, and appliances, and much subsequent expenditure of money and labor for its proper maintenance. As a result we should be able to show farmers very little which they could not learn from many estates maintained by private funds and very little which would be of practical value to a man of limited means.

. "The results obtained on such a farm [one conducted for profit] give in the nature of things only a local and limited application. If they were of value for the grain growers, they would be of little use to the stock and dairymen and *vice versa*."

Later at a time when few people had any large realization of the importance of underlying principles, in raising the question of abstract research versus "practical" experiments he stated that each had its place in the work of the experiment stations, that there was no innate antagonism between them, and that "no high ideal worthily followed ever interfered with faithfulness to the humblest duties, the station with the highest ideal of its functions will be the most efficient in the simpler and more prosaic duties which are a legitimate and proper and important part of its work."

In his report for 1892 Dr. Armsby first mentioned a "need for a scientific study of the problems of animal nutrition, a combined respiration apparatus and calorimeter for determining the heat value of foods together with provision for the current expenses of the experimental work along this line."

Concerning the experiment station as an educational institution, in his report for 1894, he says:

"In popular regard, the experiment station has been looked upon to a considerable extent simply in the light of an investigating institution. It has been considered as something distinct from, although related to and under the guidance of, the agricultural college. Essentially, however, the experiment station is for the higher education in agriculture. It is the agricultural university, devoted to the advancement of knowledge in this field and pursuing this aim by means of the true university method—namely, original research.

.....“It is intended to be a concentration of the highest intellectual activity along agricultural advancement and should be the center and inspiration of all the other work in this line.....and I believe it to be the fact that those experiment stations which are at present doing the most efficient work in their own lines are also those which are exerting the greatest influence upon agricultural education in general.”

In his Annual Address as President of the Association of American Agricultural Colleges and Experiment Stations in 1899 he expressed himself concerning the work of the experiment station, as follows:

“It is our agricultural university, devoted to the advancement of learning, the promotion of investigation, the source not merely of knowledge but of inspiration for the whole organism.

“My thesis is, then, that the most important function of the American experiment station is that of an institution for higher education in agriculture, the organic head of our whole system, that it should be supported and managed in the light of this fact.

“It seems to me that the time has fully come to discard this notion (“that the work of the station is distinct and essentially different from that of the college—that the station is in the college, but not of it”) and to recognize the station as unreservedly an integral part of the agricultural college, with its own distinct and peculiar functions as an educational institution.”

In the same address he says concerning the relation of the experiment station to the farmer:

“The function of the experiment station is not the impossible task of giving him [the farmer] recipes suited to every conceivable emergency. Its business is to enlarge his knowledge of the natural forces which drive his farm.....and to teach him to control them instead of being controlled by them. It is not a device to save the farmer the trouble of thinking. On the contrary its consistent and insistent demand is that he think more.....The true field of work of the experiment station is the farmer’s mind, not his acres.”

In addition to the twenty annual reports of the Director, 1887 to 1906-7 inclusive, Dr. Armsby was the author or joint-author of more than fifty bulletins and reports published by the Experiment Station. Bulletin No. 2 of the Pennsylvania Experiment Station was on the “Fertilizer Experiments” and in Bulletin No. 3 he began the work in animal nutrition. It was on the “Composition and Digestibility of Corn Stover.” Bulletin No. 5 was on the “Digestibility of Rye”; Bulletin No. 9, “Digestibility of Corn Fodder and Silage.” The next bulletin prepared by Dr. Armsby was No. 15 which was issued in April, 1891, and shows that he was not yet giving his attention exclusively to animal nutrition. It was on “The Influence of the Variety and Grade of Seed on the Yield of Ensilage Corn.” October, 1892, he published a bulletin on “The Koch Test for Tuberculosis.” This was a report of work done in coöperation with the State Board of Agriculture.

In May, 1898, a rather elaborate bulletin, No. 42, was issued on “The Maintenance Ration of Cattle.”

The announcement of that bulletin states, "Up to a very recent date our knowledge of their [cattle] maintenance requirements had been based chiefly upon six experiments made by Henneberg and Stohmann in 1858. The results of these experiments and the feeding standards derived from them by Wolff entered into the literature of the subject and passed current, comparatively unquestioned, fully two decades.

"At about this time the results of several more or less carefully conducted experiments were published which seemed to show that the accepted standard for the maintenance of cattle was too high.

"A subsequent study of these experiments and a consideration of their apparent irreconcilability with the Henneberg and Stohmann results, led the writer to consider further investigations of the question desirable and the experiments described below [in this bulletin] were instituted in the winter of 1892-3 and continued during 1893-4, 1894-5, 1896-7."

He was early convinced that the common methods of comparing feeds, based upon their digestible matter alone, or the proportion in which the various nutrients were found, did not afford a true measure of their feeding value; that there were other factors which the chemists had not recognized, although practical stock feeders were certain of their existence. He recognized the importance of the energy function but found that the energy of the food digested did not bear a constant relationship to the production of the animal. These problems he had presented to the sci-

entists of the United States Department of Agriculture who were impressed by them. This presentation, together with the confidence which the members of the Federal Department had in Dr. Armsby, led to a proposal made to the College in 1898 that he undertake in coöperation with the Bureau of Animal Industry a series of investigations in the fundamental principles of animal nutrition.

This project involved a number of new problems and measurements that had never been undertaken. In order to measure the total intake of the animal, gaseous and thermal as well as liquid and solid and their final distribution and disposition, a great deal of new apparatus had to be constructed. A small set of apparatus for similar measurements with man had been developed at Middletown, Connecticut, and it was decided to construct a somewhat similar set on a much larger scale, adapted for experiments with cattle. These measurements involved also a number of new mechanical features not required with a human subject.

The result was the construction of the respiration calorimeter, the only one of the kind in the world. It was completed early in 1902 and the first experiments were started immediately. Through it the theories of animal nutrition have been revolutionized. It was found that the total vital functions could be measured in heat units. The apparatus and technique are such as to make possible the carrying on of experiments under perfectly controlled uniform conditions within a considerable range of temperature.

Dr. Armsby was not only able to verify his beliefs but determined many new facts concerning nutrition. He reduced the feeding standards from three factors to two, basing them upon protein and energy instead of protein, carbohydrates, and fats. He worked out the net available energy or production values of a large number of the common feeds. Farmers' Bulletin No. 346 is a popular presentation of his feeding standards.

A description of the respiration calorimeter was published in the Annual Report for 1903-4 and in Bulletin No. 104 of the Pennsylvania Experiment Station issued in 1910. A description was also published in the Experiment Station Record Vol. XV, No. 11.

Dr. Armsby was active in the work of the Association of American Agricultural Colleges and Experiment Stations from its very beginning. In fact, he was one of the original representatives called to Washington by the Commissioner of Agriculture in 1885 to consider such an organization. He served as secretary to the Association in 1890 and as president in 1899, and always had a prominent part on its leading committees. He was chairman of the Committee on experiment station exhibits at the Chicago World's Fair in 1893 and at the Paris Exposition in 1900. He was also active in the organization of the American Society of Animal Nutrition and served as president, 1908 to 1911. He was president of the Society for the Promotion of Agricultural Science 1905 to 1907. He was a member of the National Research

Council and chairman of its Committee on Animal Nutrition. In all these positions he was an active and aggressive worker.

Scholastic honors also came to Dr. Armsby in recognition of his work and attainments. The University of Wisconsin conferred upon him the Doctorate of Laws in 1904. In 1920, the honorary degree of Doctor of Science was conferred upon him by Yale University. In 1921 his Alma Mater, Worcester Polytechnic Institute, honored him with the same degree on the fiftieth anniversary of his graduation, the first time such a degree had been conferred by that institution.

The recipient of these honors was often called for consultation by the scientists of the United States Department of Agriculture, and was a teacher in the graduate schools held by the department for experiment station workers. He was a member of the staff of the Journal of Agricultural Research and contributed a number of articles to its columns. He was also a contributor to other scientific societies such as the National Academy of Science.

He prepared for the Federal Department of Agriculture, Bureau of Animal Industry, Bulletins No. 51, 74, 101, 108, 128, and 139. Farmers' Bulletin No. 346, The Computation of Rations for Farm Animals by the Use of Energy Values (1909), and a revision which was issued as U. S. Department of Agriculture Bulletin No. 459, The Use of Energy Values in the Computation of Rations for Farm Animals (1916), were from his pen.

Besides the *Manual of Cattle Feeding* already mentioned, he published in 1903, *The Principles of Animal Nutrition*, and in 1917, *The Nutrition of Farm Animals*. The latter is a text and reference book of some 750 pages, suitable for college students, in which the author brings his subject down to the latest information of the time. The former was based on a series of lectures which he gave at the first graduate school of agriculture, held at the Ohio State University in 1902. It is a more technical work and "deals with the income and expenditure of matter and energy in the animal organism." In 1918 he published a small book, *Conservation of Food Energy*, in which some of the principles of nutrition were presented in popular form with special reference to food problems incident to the war. At the time of his death he had in preparation a work which has since been brought out under the title, *The Animal as a Converter*, by Armsby and Moulton.

In all his writings he never failed to give full credit to any junior author who had collaborated with him.

Again Dr. Armsby was honored by being elected a member of the Royal Society of Arts of Great Britain in 1911, and of the Royal Academy of Agriculture of Sweden in 1912. He became a member of the National Academy of Science in 1920. He was a member of the National Research Council from its organization and as a member of the Committee on Foods and Nutrition was sent to Europe by the United States Gov-

ernment in 1918 as a delegate to the Interallied Scientific Food Commission.

While his major interest was in the underlying principles of animal physiology, and while his administrative duties were heavy, he did not lose sight of the practical application of these interests to the common farmer or man who must make the cultivation of the soil and the production of animals his livelihood. During the early days of Farmers' Institutes in this state he gave freely of his time to increase their usefulness and put them on a higher plane. In order that he might come in closer contact with the farmers and have a first-hand knowledge of their problems he associated himself with the Patrons of Husbandry by joining Victor Grange No. 159 at Oak Hall Station. He retained his membership while Director of the Experiment Station and was a frequent speaker before the State Grange as well as the county and subordinate bodies.

In 1900 when the work of The Pennsylvania State College was divided into schools Dr. Armsby became Dean of the School of Agriculture. This office he retained until 1904 when, at his request, it was turned over to Dr. Buckhout in order that Dr. Armsby might give his entire time to the Experiment Station. In 1907 he decided that he wanted to devote all of his time to animal nutrition problems and asked to be relieved of the administration of the Experiment Station. His request was granted and the Institute of Animal Nutrition was organized with him as Director.

Dr. Armsby always had the confidence and respect

of those who worked with him or under his direction. No one ever had more cheerful loyalty from his associates.

The following memorabilia written especially for this sketch by Dr. Charles A. Browne, Chief of the Bureau of Chemistry of the United States Department of Agriculture, is indicative of the impressions Dr. Armsby made upon those who worked with him:

“Although I met Dr. Armsby in 1895, it was not until after I went to work at the Experiment Station in 1896 that I became acquainted with him. In my own first experience I did not find him as approachable as Dr. Frear. He came into the laboratory at infrequent intervals and it was only in the Experiment Station library that occasional opportunities were given for meeting and conversation. The station chemists very rarely ventured into Dr. Armsby’s private office, this usually being done for the purpose of asking him for a leave of absence or for an increase of salary. I believe that my acquaintance with Dr. Armsby did not pass beyond the formal state of merely greeting each other as we passed until after we had met in a more social way at the faculty whist club. This club was composed of various members of the faculty and their wives. I remember more especially Dr. and Mrs. Armsby, Dr. and Mrs. Pond, Dr. and Mrs. Tuttle, Professor and Mrs. Reber, and Professor and Mrs. Butz. At the weekly meeting of this club it usually happened that one of the faculty members was absent from town and I was frequently asked on such occasions to fill out the number of

players. Duplicate whist was the favorite diversion at that time and there were several excellent players upon the faculty. Dr. Armsby in his usual painstaking way made a careful methodical study of the various leads and systems of whist. He played slowly and intently and enjoyed analyzing the game after the cards had all been played.

"Dr. Armsby at this time was fond of bicycle riding, as was nearly every member of the Experiment Station force, and I frequently met him in the country on a lonely spin.

"As I became better acquainted with Dr. Armsby he would frequently discuss with me the chemical phases of the analytical work which I did in the laboratory, more especially in connection with his experiments upon cattle feeding. One point which Dr. Armsby called to my attention was the inefficacy of the ordinary ground glass stopper in preventing the escape or absorption of moisture from feed samples in bottles.

"Early in the year 1900, when I made up my mind to do postgraduate work at some university, it was largely through Dr. Armsby that I was persuaded to go to Germany.

"At Göttingen University I was able to estimate the high opinion which German scientists had of Dr. Armsby and his work. At a meeting of German professors and students which I attended one evening, a student read a paper upon stock feeding in which he alluded very slightly to the work in this field in America. When the student had finished Professor

Lehmann, the German authority on stock feeding, arose and in a few sharp sentences reprimanded the student for his ignorance. He then proceeded to laud the work of American investigators upon stock feeding and, more particularly, of Dr. Armsby.

“My work at Göttingen was largely upon the pentosans and after my return to State College I made an investigation of the pentosans of timothy hay upon which Dr. Armsby was conducting feeding experiments. The utilization of the digested pentosans in the animal organism was a question which Dr. Armsby used to discuss with me frequently.

“In the summer of 1905 when yellow fever broke out in New Orleans, Dr. Armsby very kindly offered me the use of the Experiment Station laboratory in which to conduct my work. I availed myself of this privilege and had an opportunity of asking Dr. Armsby's frequent advice upon some feeding experiments which I was conducting at that time upon rice products.

“Dr. Armsby occasionally visited me in my office in New York City and on such occasions usually enjoyed looking up other State College acquaintances. I saw him for the last time in June, 1920, in the New York Subway at Times Square. He was returning from Yale University where he had just been awarded the honorary degree of Doctor of Science. He spoke with pleasure of the fine spectacle which the Academic parade made on the Yale Campus.

“Dr. Armsby at the time of his death was unquestionably the world's most eminent authority upon

cattle feeding. His work as a scientist was characterized by a wonderful attention to detail, by wide vision and by great caution. He was thought by some investigators to be over-cautious, yet this trait of his cannot be called a failing; it was rather an evidence of his zealous devotion to truth and nothing but the truth. His death was most unfortunate for he had plans for experimental work that would have still further enriched the subject of animal nutrition. His name will always rank among the foremost of the agricultural scientists America has produced.”

John Fields, Editor of *The Oklahoma Farmer* a member of the Class of 1891, sometime an assistant chemist in the Pennsylvania Experiment Station, and later Chemist and Director of the Oklahoma Experiment Station, says:

“I knew Dr. Armsby as Director of the Experiment Station, but I cannot really say that I got acquainted with him until he went fishing one summer with Waters,¹ Reber,² Leonard Pearson³ of the University of Pennsylvania, Price Jackson,⁴ and myself. Afterward, in my private capacity and not as Assistant Chemist of the Experiment Station, I gave him, in his private capacity and not as Director of the Ex-

¹ H. J. Waters, Professor of Agriculture; later, Dean of the College of Agriculture and Mechanic Arts, and Director of the Experiment Station, Missouri University; President of the Kansas State College; and, at the time of his death, October 26, 1925, Editor of the weekly *Kansas City Star*.

² L. E. Reber, Professor of Mechanical Engineering and Dean of the School of Engineering; later, Director of Extension, University of Wisconsin.

³ Leonard Pearson, State Veterinarian and Dean of the Veterinary College of the University of Pennsylvania.

⁴ John Price Jackson, Professor of Electrical Engineering; later, Dean of the School of Engineering.

periment Station, a good cussing for neglecting to wash the dishes when his turn came. The ice was broken and we became good friends. He was a serious student and a good man to start the Experiment Station off right."

The impression which his reserve nature often made upon persons at first is indicated by the following from Dr. H. J. Patterson of the Maryland Experiment Station:

"Dr. Armsby came to State College theoretically about six months before I came here but, owing to sickness and other matters, in reality he was at the College only a few weeks before I left. I never saw much of Dr. Armsby while I was officially connected with the Pennsylvania Experiment Station; consequently, I do not feel that I ever got to know him from my official relations. After leaving college I was thrown with him in various ways, but I never felt that I really got well acquainted with him. He was a man for whom I always had a very high respect, although to me he seemed very reserved. He always impressed me as being exceedingly thorough and well-grounded in his special field. He had an unusual faculty of putting things in a clear, concise way. He always impressed me with possessing a high degree of justice and firmness."

G. G. Hutchinson, a member of the State Department of Agriculture and a trustee of the College, says:

"Armsby will be appreciated as the years slip by. He had no intimates and few knew much of what he

was doing. His work was, in general, too far above the ordinary conceptions to be popular."

Professor I. Thornton Osmond, Professor of Physics from 1879 to 1907, who saw the College pass through some of its most discouraging times and who is now living at Carlisle, Pennsylvania, as Professor Emeritus, writes:

"I had the pleasure of knowing Dr. Armsby not only socially and as a member of the Faculty, but by being associated with him for two or three years as physicist for the design, construction, and installation of the Respiration Calorimeter. This more intimate association with Dr. Armsby did but increase my esteem for him personally and as a scientist."

Harry Hayward who was Assistant Agriculturist in charge of dairy work from 1894 to 1902 and later Director of the Delaware Station, characterizes Dr. Armsby as:

"Diffident; sensitive; conscientious to a high degree; a hard worker; a great scientist. A man whose real constructive ability was not appreciated by his own day and generation; but his work and the principles he discovered will be a guide for the scientists of generations to come."

To Dr. A. C. True, Director of the Office of Experiment Stations of the U. S. Department of Agriculture, "Dr. Armsby was preëminently a scholar and investigator. He studied carefully, impartially, and thoroughly what other men had done in his line of work and on that foundation sought for new truth. He was a patient and tireless worker, watching all

details, and unwilling to publish anything until he felt sure of his results.”

C. H. Waller, of the Coöperative Extension Work of Texas, was graduated from The Pennsylvania State College in 1905 and was a student under Dr. Armsby from 1900 to 1905. He writes in a letter to the author:

“As a student under the instruction of Dr. H. P. Armsby in Animal Nutrition, I might preface my statement by saying that it was due to Dr. Armsby that I singled out The Pennsylvania State College for my agricultural training. His bulletins on food, feed, and animal nutrition created in me a desire to study under a real authority, and have an opportunity to study the man who developed so much.

“His unassuming attitude, ease of approach, genius without any idiosyncrasies, even temperament, thoroughness in preparation of each lecture, and, almost to a fault, his patience in explaining in detail every point in his lecture, were some of the qualities which made Dr. Armsby an ideal instructor. His field was in its embryonic stage at that time, and his painstaking explanations, a small matter perhaps to some, to me taught a great lesson.

“Every notebook was carefully blue penciled as to words, sentences, and correctness in every detail of thought. It taught carefulness and accuracy, an inherent quality of his makeup.

“Dr. Armsby’s personal appearance was at all times an example to the students, as to his immaculate linen, shined shoes, and being generally well groomed.

“His faithfulness to the living monument he left

behind in the shape of the "Calorimeter" was impressed upon each student whose good fortune it was to see it in course of construction."

As an indication of the regard in which he and his work were held by the Federal Department of Agriculture one of the finest tributes is found in the *Experiment Station Record*, Vol. 45, No. 7, by Dr. E. W. Allen, the editor. From it we quote:

"Fundamental as Dr. Armsby's work was, and important as are its applications in relation to feeding and the large questions of food supply, it was only in part understood. In its broader and more essential reaches it had not within itself the elements of popularity. It was quite highly technical and, for the time being, much of it related to basic principles rather than immediate applications in practice. He was too busily occupied and too cautious to attempt the broad generalizations which some might have made to emphasize its popular importance. His quiet modesty was doubtless another factor in the situation. But his work commanded universal respect and was accepted as being right in character, filling an important need, and deserving of liberal support. His passing brings a realization of the misfortune of delay.

"Dr. Armsby won high honors, for himself not only but for his institution and for the system with which he was so long connected. He was a proud possession. The lines of research in which he was a national leader were not completed—they were only well under way. They opened up well-nigh unlimited possibilities for extending the boundaries of exact knowledge in rela-

tion to a subject of vast importance. What he did was prepared for larger accomplishment which with each step will bring more directly home the significance of such inquiry to both theory and practice.

"He has left a monument such as few men can boast and his work will live on and continue to fruit in the lives of those who succeed him."

During the construction and operation of the calorimeter, no one was closer to Dr. Armsby than J. A. Fries. Mr. Fries combined the training of chemist with that of machinist and much of the mechanical detail of the apparatus was designed and constructed by him. When the Institute of Animal Nutrition was organized he was made Vice-Director. From a sketch written by him for "Fifty Famous Farmers," we quote:

* "Henry Prentiss Armsby was a man of average height and slender build. He was not a social man in the usual sense of that word and would not waste his time in trivial and foolish things. Being a scholar and thinker, he acquired a sober, thoughtful expression and gave the impression of being distant. That impression, however, vanished the moment he spoke, for the kindly expression and genial greeting and courtesy instantly inspired confidence. He was never hilarious or boisterous, but during friendly intercourse one would frequently hear his short, genuine, characteristic laugh. He was very modest, almost to timidity, and always kept himself in the background.

* Ivans and Winship, "Fifty Famous Farmers." Copyright, 1924, by the Macmillan Company. Reprinted by permission.

There was always a calm dignity and gentlemanliness and an unruffled appearance about him, and he was such a master of himself that those who have known him intimately during the last thirty-four years never saw him lose his temper. Conservative by nature, he was personally acquainted with many great scholars and investigators at home and abroad, and he thoroughly enjoyed their company through their books and investigations."

Thus we may describe him as quiet, dignified, apparently somewhat shy; always well groomed and dressed for the occasion; filled with a zeal for his work, but never given to "talking shop" unless drawn into it or when the occasion required it, and disinclined to advertising. He was always courteous and kindly, helpful to the younger members of the faculty and staff and to the students with whom he came in contact. While devoted to his work which involved much abstract science, he did not allow it to separate him from the human side of life. He enjoyed a game of cards or tennis, and was for some years the only golf fan on the campus. He was a student of the Bible and attributed his facility in the use of English largely to his habit of reading the Scriptures. He inherited from his parents a religious inclination and was active in church work. His disposition and work precluded his having intimate friends; yet all held him in high regard and none held aught against him. Long may his memory live, an example, a guide, and an inspiration to those who seek greater knowledge for the good of mankind.



WILLIAM ARMSTRONG BUCKHOUT

ALLECHENY COLLEGE LIBRARY

III

WILLIAM ARMSTRONG BUCKHOUT

December 26, 1846

December 3, 1912

WILLIAM ARMSTRONG BUCKHOUT was born at Oswego, New York, December 26, 1846. His father, Abram Buckhout, was of the original Holland-Dutch stock of New York. His mother's maiden name was Margaret White. An older brother, Nathan White Buckhout, served in the navy during the Civil War. His only sister, Anna Cheney Buckhout, married a Congregational minister, the Reverend Frank Greeley, and is the mother of William Buckhout Greeley, Chief of the Bureau of Forestry of the United States Department of Agriculture.

Abram Buckhout was a successful hatter and furrier; he was also somewhat interested in real estate, especially farm lands. His business was prosperous and he naturally planned a business career for his son; but the call of the garden and the forest was too strong. William was interested in science and wished to study in that field. He attended the public schools of his home town until 1864 where it was said that "he was characterized by meritorious work." When he wished to pursue his studies further, the father

consented only on condition that William earn the money to pay his own way. Having earned and saved one hundred dollars working as a market gardener and trucker during one season, his father consented to help him continue his studies. Accordingly, in February, 1866, he entered the second year class of the Agricultural College of Pennsylvania. The course at that time being of three years' length, he was graduated in 1868 with the degree of Bachelor of Science in Agriculture.

The Morrill Land-Grant Act had been passed by Congress and signed by President Lincoln, July 2, 1862. There was much speculation and discussion in the various states concerning it. Pennsylvania, Maryland, and Michigan had already established schools of agriculture when the Act was passed.

None of the other colleges at that time seemed to have had a man of the ability, training, and vision of Dr. Evan Pugh, the first President of the Agricultural College of Pennsylvania, who had served on the Staff of the famous agricultural experiment station at Rothamstead, England, under the noted chemist, Sir Joseph Henry Gilbert. "The correspondence of Dr. Pugh, still preserved, shows that many inquiries were received and much interest awakened in the new institution from Maine to California." Although Dr. Pugh died in office in 1864, the impetus he gave the work continued. Only about six other states had made arrangements for accepting the provisions of the Land-Grant Act by 1866. A college for the "liberal and practical education of the indus-

trial classes'' was an experiment, and real pioneering had to be done. Cornell University was not opened until October 7, 1868.

An index of Dr. Buckhout's interest in and attitude toward his work as a student is found in the catalog of 1867, the last one in which the students' grades are printed. On a scale of 10 he was given 9.6 in scholarship, 10 in conduct, and 10 in industry.

Joseph T. Rothrock, S.B., M.D., who later became the "father of forestry in Pennsylvania," was Professor of Human Anatomy, Physiology, Botany, and Geology. Dr. Rothrock saw in young Buckhout the material for the making of an excellent teacher and advised him to continue his studies with this object in view. After spending some time in graduate work with Dr. Rothrock, he entered Harvard University where he studied under Dr. Asa Gray. He was afterward associated with Dr. Rothrock on the State Forestry Commission.

During the summers young Buckhout continued his market gardening work until 1871 when he was called back to his Alma Mater as instructor in Natural Science. From 1868, the time of his graduation, to 1871, the time of his first connection with the faculty of the College, he was variously occupied as a graduate student in this college and at Harvard University, and with his gardening and trucking work in his home town.

In the circular for 1871 the name of W. A. Buckhout first appears as a member of the faculty. In that circular his title was Professor of Botany, Geol-

ogy, etc. Dr. Rothrock retired from the faculty about the 1st of May, 1870, and the place had been temporarily filled by the appointment of Dr. J. Y. Dale, the College physician.

Prior to 1870 the College offered but one course of study. Announcement was made that year of three courses "or rather durations of instruction": "First, the Agricultural Course," "Second, the Scientific Course for Civil Engineers, and practical general mechanics, etc.," and "Third, the Literary Course, for general or thorough scholarship, or in preparation for what are termed the learned professions." It may be said that in this year no students were enrolled in the Literary Course. Thomas H. Burrowes was President and Professor of Civil Government, Practical Agriculture, and French. Dr. Burrowes died in 1871 and was succeeded by Dr. James Calder.

As an indication of the high ideals held by the faculty in the early days, it is interesting to note that many of the early catalogs contain the following announcement:

"A knowledge of certain branches is indispensable to all without reference to class or profession: 1. The branches embraced in what is called a sound English education; 2. A knowledge of the structure and laws of health of the body; 3. A knowledge of the Constitution and government of the country; 4. A knowledge of the great principles of man's relation to Deity, and from the study of these no student can be exempted."

As an example of the variety of subjects taught by

one instructor, Dr. Buckhout's schedule for one semester shows that he had classes in botany, zoölogy, horticulture, physiology, geology, and free-hand drawing. In addition, he at various times taught anatomy, forestry, and probably other subjects.

The year 1871 seems to have been about the low-water mark of the institution; the number of students in attendance was only thirty-nine although the catalog states there were accommodations for four hundred. Later catalogs give the capacity of dormitories, class rooms, laboratories and refectory, as three hundred and thirty. At the close of the fall session, the enrollment had reached sixty-seven. The President reports, "the dismissal of four students for the repetition of serious offenses has been productive of much good, not only in the College but in the community around it."

"Two young ladies applied for admission in June." They were accepted by the faculty, subject to the approval of the trustees. This approval was given in September and they were, with four others, admitted that year. In approval of this action Dr. Calder said: "I perceive that the admission of ladies will introduce a powerful element which will make itself felt in the improved work of discipline and great prudence and consideration will be required to avoid lamentable irregularities." The catalog for 1872 shows the names of twenty-three young women enrolled.

In 1872, tuition was made free and students were granted permission to room and board outside the

building if they wished to do so, except in such cases as the President might deem the arrangement injurious to the student. This permission greatly increased the enrollment in the preparatory department.

The name of the institution was changed by the Court of Center County in the January term, 1874, from the Agricultural College of Pennsylvania to The Pennsylvania State College. This action was taken the better to express fully the object of the institution as set forth by the first Morrill act.

It is a significant thing, as showing how problems persist, that in Professor Buckhout's report for 1879-80 he emphasizes the importance of having "a well and thoroughly considered plan comprising all of the so-called campus and its belongings, to be agreed upon by the authorities as the basis for our future work." (An ideal which continues to be in the air but never realized.) He says, "The best interests of the institution demand a carefully considered plan as an imperative necessity." The immediate occasion of this suggestion was probably the fact that greenhouses and buildings for botany and horticulture were to be erected. Professor Buckhout's recommendation was that what was then the ball ground be used for those buildings. He asked also for a gardener to work in the gardens and among the trees and shrubbery on the campus. He says the gardener should be a man capable of overseeing and instructing students and laborers. At the request of Professor Hamilton, Patrick Pearl had been appointed gardener in 1872, and was succeeded by Thomas Clark in 1873. The posi-

tion, however, seems to have been discontinued in 1874.

Concerning the teaching at that time, Professor Buckhout says, "Nothing is more pleasant than to direct the work of students who are interested in such matters. Nothing is more unpleasant and difficult than to direct the work of students who are not interested. In the latter case, a professor becomes simply an overseer."

During Dr. Buckhout's student days his roommate was Albert H. Tuttle who afterward became a prominent member of the faculty of the University of Virginia. The friendship formed during those days between these two young men continued until Dr. Buckhout's death. As a manifestation of this friendship, it was mutually agreed that each should name his oldest son for the other. Therefore, Dr. Buckhout's oldest son was named Albert Tuttle Buckhout and Dr. Tuttle's oldest son was named William Buckhout Tuttle.

July 12, 1876, Professor Buckhout married Miss Mary L. Harkness of Philadelphia who was a first cousin of his friend Tuttle and whom he had met at a house party in the latter's home in Cleveland, Ohio, a short time before.

Mrs. Buckhout was a woman of much ability and strength of character and remained active in the social and civic life of the community until her last illness. Their three sons were educated in Dr. Buckhout's Alma Mater, but the two daughters, Mrs. Charles L. Kinsloe and Mrs. William G. Edwards,

were sent the one to Vassar and the other to Smith College.

Professor Buckhout received the degree of Master of Science in 1874. In the same year he was made Librarian and he served in that capacity until 1878. In 1878 he became Secretary of the Faculty, which position he held until 1889.

As an evidence of Dr. Buckhout's interest in the community and in civic affairs, it should be noted that he served as member of the Borough Council at its organization and was its president for a number of years. He was a fellow of the A. A. A. S. and a member of Phi Kappa Phi, honorary scholastic fraternity.

"In recognition of his scholarship and his service to education" the degree of Doctor of Science was conferred upon him in 1904; the first, and with a single exception, the only time, to date, (1925), that a Doctorate has been conferred by The Pennsylvania State College.

Dr. Buckhout was a member of the Presbyterian Church where his attendance at the morning service is said to have been punctual and invariable. At exactly the same minute every Sunday morning it is said that he left his house for the church. He usually attended only one service a week but was very regular about that one. When the church was organized, he was elected an elder but he declined the office.

Dr. Buckhout established the Forestry Course at The Pennsylvania State College. When Dr. Rothrock was Commissioner of Forestry in Pennsylvania, he

desired that such a course be established but the College authorities could not see their way clear to establish it at that time. On that account, Dr. Rothrock established the Pennsylvania Forest Academy at Mont Alto. Later, the President of the College, Dr. Atherton, conceived the idea of offering a course in Forestry in the School of Engineering, and just before his last illness did some work on such a project. After his death, the Trustees authorized that a forestry course be offered in the School of Agriculture rather than in the School of Engineering. The data which Dr. Atherton had accumulated were, therefore, turned over to Dr. Buckhout who outlined the course and began the instruction. To assist with the instruction and organization of the work, Dr. B. A. Fernow, who had been Head of the Forestry School of Cornell University, was employed; but he remained at the College less than one semester when he was called to the head of the Department of Forestry at Toronto University. The work was again left wholly in Dr. Buckhout's hands till the coming of Hugh P. Baker as Professor of Forestry.

The publication of bulletins giving the results of agricultural experiments was begun by the College in 1882. Bulletin No. 1 bears the date of November 15 of that year. The first six bulletins were by W. H. Jordan, Professor of Agriculture. Bulletin No. 7, December 10, 1883, "Notes on the Experiment with Native Potatoes, by Professor Wm. A. Buckhout," was the first bulletin issued that was not prepared by the Professor of Agriculture. This bulletin was a

brief description of a test made of native tubers of the wild potato which had been collected in Arizona in 1882 and sent out by Mr. J. G. Lemmon of Oakland, California. It seems there was considerable popular interest in the possibility of crossing the improved potatoes with these wild ones hoping thereby to lessen the "liability of disease" and "produce a progeny that would have increased vigor and producing power." The results of the test made by Professor Buckhout and published in this bulletin were not favorable to such method of producing improved varieties of potatoes.

Two articles by Professor Buckhout had previously been published in the Annual Reports: "The Hardy Catalpa in Pennsylvania" in 1881 and "Notes on Some of the Principal Trees, Shrubs and Vines Found on or near the College Grounds." In the first he gives the general and special feature of the hardy catalpa (*Catalpa speciosa*) and recommends its planting for quick growth and hardiness. In the latter, more than one hundred species of trees and woody plants are listed and their characteristics given. These include the most prominent of the native trees and shrubs with a few of the introduced ones that were being grown on the College grounds. Other important papers published by him were, "An Estimate of Geologic Time," "Formation of the Annual Rings of Wood in European Larch and White Pine," "The Chestnut as Food and Fruit," "The Effect of Smoke and Gas on Vegetation," "Forest Fires," "Care of Woodland," "Miscellaneous Notes in Botany

and Forestry," "The Periodic Cicada of Pennsylvania," "A Microscopic Examination of the State College Water Supply (Not Including Bacteria)," etc. He was not a voluminous writer. All his bulletins and reports, moreover, are direct and to the point, as was his teaching.

Dr. Buckhout was popular as a lecturer on scientific subjects, both at home and throughout the state. Several vacations were spent teaching in special summer normals which the Department of Public Instruction had established at various points; for this work his services were always in demand.

His painstaking carefulness and his modest disposition prevented his becoming as widely known as his accomplishments would warrant. His passion for accuracy would permit the publication of no jump at conclusions. An instance is found in his investigations on the nodules of the roots of legumes. As one of his colleagues has written: "Before Hellriegel and Wilfarth published their startling discovery of the nitrogen-gathering bacteria as purveyors to the leguminous host plant, Professor Buckhout had independently developed the principal facts upon the subject and had formulated the now accepted theory; but, with his customary caution and modesty, reserved his announcement until further tests could be carried out."

Professor Buckhout was Acting Dean of the School of Agriculture from the resignation of Dr. Armsby in 1903 to the coming of Dr. Thomas F. Hunt as Dean and Director in 1906. He was Vice-President of the

College for ten years, and during the last illness of Dr. Atherton and for a period after the latter's death was virtually President. As Chairman of the Faculty Committee on Advanced Degrees and in various other capacities he served the College better than can be estimated. As Botanist of the State Board of Agriculture he aided in keeping the contact between the College and the leading farmers of the State. As a member of the Alumni Association from its organization in 1870 and as its historian and editor of the Alumni Record to 1906, he was in close touch with all the graduates.

While Dr. Buckhout's contribution to the growth and development of the College through administrative and organizational duties was wide and far reaching, it was as a teacher that his influence was most marked. During his teaching life, from 1871 to 1912, he saw the enrollment grow from less than forty to more than two thousand, the teaching staff from seven to more than two hundred, and the plant from a single building which housed faculty and students as well as all class rooms and laboratories to more than twenty buildings used exclusively for instruction, research, and administration; and he taught every class entering within that period. All who came under his instruction testify to his earnestness and success as a teacher. His insistence on thoroughness and accuracy, his patience with backward students, and his quiet, orderly method never failed to leave a desirable influence.

For many years Professor Buckhout had to pro-

vide and prepare all the material for his courses. In the eighties, or thereabouts, the schedule of practicums was made out on the basis of two instructors; Professor Buckhout was promised an assistant but that was not provided. At one time, when the finances of the College were particularly low, he volunteered to take a reduction in his own salary, on condition that he be given an assistant. The reduction was made but the assistant was not provided. Yet he remained loyal to the end.

In the early days he spent all of his leisure, even many of his summer vacations, in the woods and mountains around State College. At that time, he was teaching not only botany but also zoölogy and geology, and there was no point of interest within miles with which he was not acquainted. The fauna and flora of the surrounding country were his special study. His trips to Bear Meadows, Penns Cave, and other localities, were always made with a special object in view. He did not take his class out merely for the sake of an outing, or because it was fashionable to go botanizing or geologizing. He knew well the geologic origin of Bear Meadows and was fully acquainted with the plant and animal life found there. The sort of mystery with which many people seem to clothe the Meadows was always of particular and amusing interest to him.

It is related that on one of his trips to Penns Cave the raft on which they entered the cave capsized, the torch was extinguished, and the entire party dumped into the water. Dr. Buckhout had, however,

taken the precaution to place a number of matches in his hat, and by means of these they were able to make their way to the dry cave and finally outside. In the party on one occasion there was a very large woman who stuck in the narrow passage from the dry cave and for some time could get neither up nor down. It is not stated whether she was the one who caused the raft to capsize.

When a man has been associated with an institution for almost half a century in its most formative stage as intimately, as influentially, and in as varied capacities as Dr. Buckhout was, his biography becomes to a large extent the history of the institution for that period. To a man continually dealing with living organisms as he was, the College itself becomes a living being, and he himself does not cease to grow. He was not a slave to method and each class became to him a new subject of study. Thus he says: "Courses and methods of study cannot be planned and put into operation once so that they will last for all time. They must needs be enlarged or varied and adjusted according to the growth of knowledge itself and the changing needs of those who pursue it."

As a more complete characterization of the qualities of Dr. Buckhout, and particularly of his qualities as a teacher, representative tributes from his pupils are presented.

H. C. Rothrock, Assistant County Superintendent of Schools of Centre County and a graduate of the College in the class of 1885, says of Dr. Buckhout:

"I had Physiology under him during my Freshman

year and later during my course, Botany. He was a very popular professor with the boys, quiet, unassuming, a tireless worker, a man who knew his subject, a Christian, and always a gentleman, one of nature's true noblemen.

"It was customary in that day for Professor Buckhout to give a farewell party—social function to the Senior Class. These were most delightful occasions and were looked forward to eagerly. I recall no professor at College while I was a student there who enjoyed a greater degree of popularity among the student body than did Professor Buckhout. We would take botanical excursions to the Bear Meadows and other parts of the county and it took some staying qualities on the part of the student to keep up with the leader. It was Dr. Buckhout who showed us the first pitcher plant growing in the Bear Meadows in the Seven Mountains. We had practicum work—trimming, pruning grape vines, budding young peach trees, grafting and budding apples—in the nursery east of the Library and west of the Auditorium. Many pleasant and profitable afternoons were spent in the nursery in practicum work. With the permission and under the direction of Dr. Buckhout our class planted five trees in the northwest of the depression in the campus known as the Open Air Theatre.

"Above all Dr. Buckhout was the friend of the boys and never seemed to forget that he was once a boy himself."

John Fields, editor of the *Oklahoma Farmer*, thus states his impressions:

“I took botany under ‘Billy’ Buckhout in 1889 and geology in 1890 and really learned a little something about them. In his quiet way, Dr. Buckhout impressed me with the fact that the work had to be done. He was a good teacher. My work with the Experiment Station after graduation did not bring me into very intimate touch with him but I know that during the period from 1887 to 1895 he was one of the solid men of the institution who assumed responsibilities and carried them well.”

Mr. George M. Downing of Philadelphia in reply to an inquiry from the author:

“As to Professor Buckhout, my knowledge of him was confined to class room, campus, and home. He was not much of a mixer, not much for social life, but his good family were unusual in their hospitality and interest in the College students. Many times our class was entertained in the Buckhout home. Professor Buckhout was quiet in manner. He commanded our respect as students because of his knowledge of his subject. We did not like Zoölogy nor Botany particularly, but we made dissections and analyses under his direction without complaint.

“I can well remember the vineyard, near the house of President Atherton, which was in Dr. Buckhout’s care. He assigned men to keep the boys away, and in this vineyard we boys did the pruning in the spring. This was our practicum—to cut back the vines to proper bud. Then when fall came and with it the

fruit, there was constant trouble to protect the vineyard against the students whose idea was to gather the grapes and eat them for refreshments."

Dr. H. J. Patterson, of the University of Maryland, writes:

"I believe no student who ever was under Professor Buckhout fully appreciated at the time his insisting upon learning a few things thoroughly and knowing not only the scientific names of plants and animals but also the derivations and full application of the names. I know to me at the time this was a great bore and seemed a useless waste of time and energy, but nothing in my college course has stood out so prominently and of as great value as his method of teaching, and the things which he insisted upon.

"Professor Buckhout never looked favorably upon short cuts. In fact it was a common saying among the students, during my day, that if his house were on fire he would not take a short cut across the campus, but would take time to walk deliberately around on the regularly prescribed paths. On my visits to State College, after leaving, I always made it a point to spend an hour or so with Professor Buckhout and always was refreshed by a conversation with him, and always got some new information which was valuable. Dr. Buckhout never believed in making a show of science or using much publicity as to his accomplishments; consequently, he was not as widely known in his field as his work would warrant."

Harry Hayward, of Devon, Pa., thus describes Dr. Buckhout:

“A most conscientious teacher of the highest order, typical of the old time college professor. His activities were so regular that clocks could be set with accuracy when he passed a given point on his way to or from the college; a man of unusual social qualities and deeply loved by those who knew him intimately. Dr. Buckhout was one of those rare characters who are not developed by the modern college or university.”

C. H. Waller of Prairie View, Texas, writes of Dr. Buckhout:

“It was my good fortune to be under Dr. Buckhout for two semesters, and it was a pleasure to see him at work in his laboratory. He talked above an ordinary tone of voice at no time, and there was never a word amiss. Although the School of Agriculture was small at that time, ‘The Value of Painstaking’ was the watchword.

“All students have short cuts to the finality of laboratory work, but with Dr. Buckhout such practice had to be put aside when entering his laboratory. His method was impressed upon them from the first day to the last, as he gave each student personal attention during each laboratory period. Modesty prevailed, although he knew his subject from A to Z, and made the students feel that he DID without SAYING. Order and cleanliness prevailed to a marked degree in the laboratory at all times. Advice was given when asked for, and fairness to each student made him the honorable Dr. Buckhout that he was. Though old in years of service, he was not a fossil in his subject of

Botany. Age had given him time to ripen and study. His faithfulness to study and duty could do naught but impress these same qualities upon those who came under his instruction."

Professor J. P. Pillsbury, who was associated with him several years, says:

"I think the outstanding first impression that I had of Dr. Buckhout was that of a very quiet, reserved, and studious gentleman. I rarely saw him smile, or in anything but an earnest mood; but that he could and did enjoy life, and that his countenance could light up in a wonderful way, I soon learned. It was not long before I heard an interesting story about Dr. Buckhout which did much to increase my estimate of his ability. The story was to the effect that he had already made the discovery of the part which legumes play in modern practice, in gathering nitrogen from the air, and had prepared a manuscript setting forth his conclusions, when the work of the accredited discoverer, setting forth these facts and discoveries, was published. Ever afterward I found him on a much higher pedestal in my memory gallery. Dr. Buckhout was a perfect gentleman, one of the most cultured and highly respected of the College men, and beloved by all who knew him."

From the memorabilia of Dr. C. A. Browne we quote:

"My personal contact with Professor Buckhout was mostly acquired during a laboratory course in botany which I took under him in the late nineties for the purpose of familiarizing myself with the microscopy

of vegetable tissues such as were met with in the examination of food products. I used to slip down from the Experiment Station, in the interval of chemical work, to the botanical building where Professor Buckhout had his laboratory, and go through the exercises of dissecting and identifying various plant specimens, preparing mounts of tissues for microscopic investigation, and making drawings of sections. The course was one of the most pleasant and instructive which I have ever taken and it gave me an excellent opportunity to become acquainted with Professor Buckhout and to value his work as a teacher. His method was simple and direct without any display of pedantic superiority. After a brief description of the day's exercise he would distribute the plant materials to be studied and give directions as to what tissues or sections were to be sketched by the student. He would then pass from desk to desk, examining the work of each person as it progressed, and making suggestions and criticisms in his kindly and informal way. I never saw him lose his temper with students, although there were some backward specimens that must have aroused a secretly-felt impatience. If the drawing was bad, he would make a sketch with his pencil in order to show how it should be done. In his tactful, quiet manner, he seemed to get more real work out of his students than many teachers who believed in the loud voice of authority and reproof. In the whole year during which I worked with Professor Buckhout's classes I did not witness a single instance of disrespect on the part of

the students. He seemed to win the confidence of all who worked under him and his gentle, courteous method was one which inspired his students with love and respect.

Professor Buckhout seemed to me less solicitous of honors and rewards than any scientist whom I have ever known. This was perhaps due to a certain dislike for publicity and also the conscientious attitude which he always held to science and to his profession as a teacher. The picture of Professor Buckhout which I have always carried with me is that of a finely-bred Christian gentleman, kind and courteous to everyone, and inspiring both students and friends with his own high ideals of loyalty and service in the cause of truth."

Professor I. Thornton Osmond, who was Professor of Physics from 1879 to 1907, writes concerning some of the men whose sketches appear in this book:

"I was personally acquainted with each one of the men you mention, Dr. Buckhout, Professor Butz, Dr. Armsby, Dr. Frear, Mr. Patterson, and Dr. Jordan. Each of them was a man worthy of the highest esteem. Of their ability, vision, and initiative, the works that they did in the College and the fruits of those works are a greater testimony than any that I can give."

"Dr. Buckhout had been for some years a member of the Faculty when I came into it in 1879. He was a genial, pleasant man of quiet manner. He intensely enjoyed brilliant and mirthful passages from the writing of Warner, "Adirondack" Murray, and others. I do not suppose that he was insensible to com-

mendation or honor for his work, but I am sure that his interest in his work was not for the honor it might bring him, but in doing the work."

Dr. W. H. Jordan, a sketch of whose work appears in this volume, says in a letter to the writer:

"Professor Buckhout was of the finest type, a gentleman, and possessed of fine sensibilities. He had a scholarly mind. He was a thorough teacher who did his best to bring his students up to a high standard of work. He had a critical mind. The errors of diluted teaching offended him. He was a sympathetic and generous friend; at least I found him so. May his tribe persist!"

In a biographical sketch for the *La Vie*, published by the Class of 1914 and dedicated to Dr. Buckhout, Dr. E. W. Runkle writes:

"I know of no more fitting close to this sketch than some thoughts from an address in which Dr. Buckhout summed up his own impressions of education and life. In these the finest spirit of the man is embodied: 'I commend then to you this thought, the college of the future is not only to train men for the multiform activities of our modern world, for leadership even in them, but it is likewise to furnish the leaven, "where-with the whole is leavened," I shall no longer trespass upon your time to elucidate what may be comprised by that elastic term "Culture"; sufficient that it expresses those general and finer fields of knowledge which make not for the spectacular achievements of arts and sciences; which do not increase a man's earning power; which have not to do with the bread

and butter world ; but on the other hand do increase his usefulness as a member of our complex human society and do give him a greater satisfaction in life --of living in it as the years go by and as the great questions of what it all means force themselves uppermost in his mind. For, cover and suppress them as you may, our superior achievements in every department of human endeavor, these questions of what is the ultimate good, will rise and will demand an answer.' In words like these, the man speaks above the voice of scholar, teacher, or scientist. In sentiments like these, one has glimpses of the poet and the thinker, the soul of the man, greater than his profession, larger than his environment, a prophet to be honored indeed."

IV

GEORGE C. BUTZ

February 1, 1863

December 14, 1907

GEORGE C. BUTZ was born at New Castle, Pennsylvania, February 1, 1863. He was a son of Paul Butz, a prominent landscape architect and florist of that city. The mother, whose maiden name was Margaret Weigand, was born in Germany and was brought to this country when a small child. The father was a native of Switzerland and came to this country as a young man. He followed his profession not only in the home town but had many wealthy clients in other cities of western Pennsylvania and eastern Ohio, especially through the region north of Pittsburgh. George was the seventh child and the fourth son in a family of twelve. Two brothers, William T. and Frank P. Butz, continue the business of their father. Frank has considerable reputation as an orchid specialist.

George received his early education in the public schools of his home town and came within one year of graduation from the high school. In the fall of 1880, from the Junior class of the New Castle High School, he entered the Sophomore class at The Pennsylvania State College. At the end of his first year



GEORGE C. BUTZ

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he was awarded the McAllister prize in mathematics, and at the end of the senior year, the physics prize. About his choosing the State College his brother Frank says, "He was largely influenced by the possibility of securing military training for which he had an inclination," as well as by the opportunities it offered in botany and horticulture. He was graduated June 28, 1883, after which he engaged in floriculture at New Castle until September, 1884. At this time he returned to State College and continued his studies and taught in the preparatory department for one year. In the summer of 1885 he returned to New Castle. The Young Men's Christian Association building was then being erected in that city by Ira D. Sankey, and at its completion George C. Butz was chosen president of the association just then organized. As president, at that time, it was necessary for him to perform the duties usually assigned to a General Secretary.

In July of 1886 he went to California where one of his brothers was superintendent of an estate. Attracted by the varied flora of that State, he tramped over the hills and mountains about Pasadena and Beaumont and spent some time about San Francisco and San Jose. While in California he engaged in landscape gardening and other horticultural work. While at San Jose he received the appointment as horticulturist to The Pennsylvania State College Agricultural Experiment Station, recently established, and returned to Pennsylvania July 1, 1887.

At that time each member of the staff often had to

be versatile enough to teach several other subjects not always closely related to his major interests. In his first report to the President of the College, published in 1887, Butz mentions teaching not only horticulture, but physiology and zoölogy to the preparatory students and free-hand drawing in college classes.

The facilities for instruction were very limited, almost nonexistent. The small greenhouses attached to the Botany Building were built in 1888 and materially increased the horticultural equipment. The conservatory part was not completed until 1889.

In the report for 1888 Professor Butz expresses the sentiment that had been previously expressed by Professor Buckhout, and by numerous others since, as follows: "Before anything definite is done on the grounds, I would recommend that a plan of the entire place be prepared and adopted by which any part of the grounds may be finished as belonging to the harmonious whole."

In 1888 Professor Butz published "a list of the trees and shrubs growing on the campus, giving the botanical and the common name, the number of each species, and the year when the trees were respectively planted as near as could be determined." The records were meager and dates in some cases had to be estimated. He listed something over six hundred individual trees and shrubs representing more than eighty species. In a number of cases the species identified was represented by a single individual. This was true of the weeping willow which was represented by the "Old Willow" on the main drive and which

was destroyed in 1920. This and an American elm near the old stone quarry, now the "Open Air Theater," were the oldest planted trees on the campus, supposed to have been planted in 1859. The Norway spruces which stood along the main drive were planted in 1860. The most abundant species was the Norway maple of which there were one hundred and forty-four trees which had been planted in 1872.

In 1889, as the silver maples along the main drive were dying, Professor Butz recommended that they be replaced by more permanent trees. The next year, 1890, about eighty American elms were planted alternating with the maples which were taken out in 1902. The same year, 1890, the ash and catalpa trees were planted along the road between the campus and the Experiment Station Farm. He revised his list annually and kept it down to date during his life.

Professor Butz believed in teaching from outdoor material as much as possible. In his report for 1894 he says, "The equipment of a department of instruction in horticulture does not consist in expensive apparatus or machinery, nor in elaborate buildings made with hands, but is displayed in those magnificent structures of growth as trees and plants whose design and beauty are the marvels of the students of art and science."

He early recognized the dependence of horticulture upon the so-called pure sciences and especially cited cryptogamic botany and entomology. He made a number of studies on plant diseases and taught cryptogamic botany as part of the horticultural work.

He always regarded the testing of varieties and species, particularly the ones most recently introduced, as a legitimate part of the work of his department. Several of the annual reports of the College contain results of such tests, as well as germination tests of seeds, the examination of commercial seeds for impurities, etc. Among the plants tested was the Chinese yam, *Dioscorea batatas*, which was grown in 1891-2. While the yield was satisfactory and the quality fair, his reports were unfavorable, largely on account of the difficulty and labor involved in harvesting the crop.

Another plant tested was a red elder which Professor Waring, the first Head of the Department of Horticulture at the College, had found on one of his walks on Tussey Mountain and had cultivated as an ornamental in his nursery at Tyrone under the name of *Sambucus pubens* var. *lasciniatum*. It differed from the common red elder in having finely divided yellow leaves.

Professor Butz was especially interested in ornamentals and his training and experience had fitted him unusually well for this kind of work. The meager funds available for improvement on the campus did not afford him an opportunity for the expression which he might have wished. Much of the money available had to be expended in keeping up the drives and similar maintenance.

That his interests were not confined to ornamentals, is witnessed by the fact that most of his writings have to do with the economic food plants, fruits, and vege-

tables. He did, however, publish a bulletin on "The Proper Use of Shrubs" and one on "Evergreens of Pennsylvania."

Professor Butz was the author of Bulletins Nos. 4, 8, 10, 13, 14, 18, 19, 23, 25, 32, 37, 43, 62, and 66 of the Experiment Station as well as numerous articles published in Annual Reports of the College and Experiment Station. He was one of the first experiment station workers in America to make a test of commercial cultures for legumes. He was the first to study the possibilities of ginseng as a commercial crop and issued Experiment Station Bulletin No. 62 on the subject. He was regarded as the foremost authority on ginseng culture in the United States among the experiment station workers.

In 1892 Professor Butz was married to Miss Emma Robison of State College, and their two sons, Gerald and Charles, are both graduates of the institution which he served.

He was always interested in religious work and was made an elder in the State College Presbyterian Church at the time of its organization. He was active in the musical life of the College and the village; he was a member of the College quartette and sang in the church choir practically as long as he lived.

Professor Butz was progressive and energetic in mind, and always assisted in promoting and supporting whatever promised to add to the convenience and comfort of the community. His interest in civic affairs is attested by the fact that he was a member of the committee which had the project in charge and to

whose activity it was due that the village of State College was separated from College Township and made a borough in 1896. He was temporary chairman of the organization meeting of the first Borough Council.

In 1898, in connection with Professors Foss, Reber, and Jackson of the School of Engineering, he organized the Nittany Printing and Publishing Company and started the first periodical, the *State College Times*. In 1905 he was one of a group of citizens who organized the Nittany Heat, Light, and Power Company. He was also one of the promoters of the Nittany Inn, which was built in 1894, of the First National Bank, and of the State College Hotel.

There follow the recollections of some of those who knew him as a student, a teacher, a lecturer, a station worker, and a citizen.

Professor J. P. Pillsbury, who was associated with him several years, says:

“Professor Butz I had opportunity to know somewhat more intimately than I did Dr. Buckhout and, of course, I did not feel as much of a barrier to his acquaintance. I soon came to think very highly, and even affectionately, of the man and to regard his abilities as a horticulturist as of high order. Professor Butz was very much like Dr. Buckhout in his quiet, studious habits. His influence upon his men was characteristic of him in everything, except when overcome by disease at the last. I think he exerted his greatest influence over his students, aside from his unlimited fund of information, by reason of his un-

quenchable optimism. He could see good in his men, and had faith in them, and expected great things of them, which resulted in their making unusual efforts not to disappoint him. It seems to me that he put his own life into his students in a way that was, and is, quite rare.

“Both these men were of the highest type of citizens, and prominent in the community, bending the weight of their influence to anything that was for the benefit of the whole community. Their passing created vacancies, which, as in the case of all good servants of mankind, seemed impossible to fill. In my own heart, as one who knew and loved them both, there is still an ache and a wish that I might see them again.”

John Fields of Oklahoma, a former student, writes:

“Professor Butz taught me a little horticulture in 1888 and I knew him quite well from then until I left State College at the end of 1895. He took a deep interest in college affairs and did his full share of the work of developing the institution, although in a somewhat minor capacity as compared to the other men.” [Armsby, Buckhout, Frear, and Patterson who were in positions of greater authority.]

George G. Hutchinson who knew Professor Butz during the latter's entire connection with the College, including his student days, says:

“Professor Butz had his subject well in hand. He was a good talker and very popular as an institute worker. He was always pleasant to meet and a gen-

eral favorite with those with whom he came in contact."

Dr. Harry J. Patterson, Director of the Maryland Experiment Station, who knew Professor Butz well both as a student and a teacher, writes concerning him:

"Professor Butz for his day was really a well-versed horticulturist. He had, I think, due to Professor Buckhout's training, an unusually good foundation in botany, and built up his horticulture upon that foundation. This attainment was exceptional and possessed by few horticulturists of his day. Circumstances made it necessary for him to cover the wide field of pomology, floriculture, and vegetable culture. If he were living today, I think he could take an outstanding place in any one of these horticultural specialities.

"Professor Butz was not only a good practical and scientific horticulturist, but in many respects he was a real horticultural artist. Professor Butz was a man of high ideals and a very pleasant man to meet socially."

Professor I. Thornton Osmond who was one of Professor Butz's teachers as well as a co-laborer writes of him:

"Professor Butz I knew first as a student in my Physics class, bright, interested, pleasant. He was making no specialty of Physics but he did good work. I still remember the neat and accurate drawings he made of compounded simple harmonic motions."

Mr. George M. Downing of Philadelphia, a member

of the class of 1888, was one of Professor Butz's closest friends, and thus speaks of their friendship:

"I knew more of Professor George C. Butz than I did of any of the other men mentioned. He was a close friend of mine during the scholastic years, 1890 to 1892, when I was instructor in the Department of Physics and Electrotechnics at State College. Mr. Butz then lived or roomed in a room in the Botanical Building and he ate his meals down town. This was before his marriage to Miss Emma Robison. At that time, I had a room in "Old Main" and there were five or six of the instructors in the college who had a telegraph line running into their rooms or houses. Professor I. Thornton Osmund, Professor James Y. McKee, Professor George C. Butz and I had instruments. During that time and just previous to Mr. Butz's marriage, his health was not good and I had frequent calls over the wire to come and spend the night with him in the Botanical Building.

"I have visited Mr. Butz in his home on several occasions. He was greatly interested in botany and took pleasure in naming the trees to me on our tramps. I could not find any plant life that he did not know which showed his profound knowledge of nature. In his garden, back of his house, he had his ginseng beds. Ginseng was so valuable at \$7.00 a pound of root that at that time it was the craze to grow it and Mr. Butz had a thriving bed in his back yard and he marketed some of it at a profit.

"Professor Butz was a loyal brother and friend. He loved music and he sang well in church choir and

in the various social gatherings given by the members of the faculty. He was a member of the German Club with Dr. and Mrs. Pond and myself and there were many social clubs and special clubs at the college of which he was a member.

“Professor Butz was a church goer, a Christian gentleman, and a true friend and he will be remembered by many as such.”

Harry Hayward characterizes Professor Butz as:

“A fine personality; one of the pioneer teachers of horticultural subjects. He was handicapped by lack of teaching equipment. He was a loyal friend and an asset to the community in which he lived so long.”

Dr. Charles A. Browne in memorabilia furnished this writer says:

“My recollections of Professor Butz between the years 1895 and 1902 are those of a merry, light-hearted man, a good fellow to know, fond of a joke provided it was clean, and ready at all times to render a service to a neighbor or friend. I think I first met Professor Butz at a meeting of the State College Scientific Association in the old Engineering Building. A topic of the meeting was dream impressions and in discussing this subject Professor Butz made the statement that so far as he knew from his own experiences or from the testimony of others no one had experienced such a thing as a definite taste impression in a dream. Among other events of this evening, as I now recall them, was the lively discus-

sion of the topics of the evening by Dr. Armsby, Professor Pond, Professor Gill and others.

“In a social way I came to know Professor Butz real well and we played together many a game of whist at which he was a past master. He and Professor Reber were usually partners and the pair was considered by the crack whist players of State College to be nearly invincible. Professor Butz threw himself with more zest into the game than any man with whom I have ever played. He was continually bubbling over with gaiety and springing all sorts of jokes and conundrums. One of the latter which he once got off at a card party created much amusement. ‘What is it,’ he asked, ‘which has eyes but can’t see, has ears but can’t hear, and yet can kick as high as a gate-post?’ Everyone gave it up whereupon Professor Butz gave the answer, ‘A dead mule.’ Professor Osmond, who was in the party, innocently objected. ‘But a dead mule can’t kick.’ Professor Butz then replied, ‘Neither can a gate-post kick,’ whereupon there was a general laugh at Professor Osmond’s expense.

“I would meet Professor Butz frequently on pleasant Sunday afternoons taking walks with his little boy, who was then about four years old, in the fields and woods about the college town. He would always stop for a chat and he took great pleasure in narrating the observations and remarks of his young son. On one such occasion Professor Butz remarked as to the precocity with which a child’s mind begins to form deductions. He said he and his little son

had just passed through the gateway to a field when the boy said that cows had been there recently. Seeing no cows in sight, Professor Butz asked his son how he knew that cows had passed through the gate. The boy thereupon pointed to some tracks in the mud and said that these had been made by cows. Professor Butz then raised the interesting question as to how early a child begins to reason in this way.

"These are only a few of the many recollections which I have of Professor Butz. The incidents I recall are all of the most pleasant character and they leave the feeling that he was a man whom it was a great privilege to know and to call a friend."

His interests and activities were varied. Of a cheerful disposition, generous in mind toward those who disagreed with him, he was a general favorite in all company. As a popular instructor, he was always in demand as a Farmers' Institute speaker. His language was clear and concise. Direct statements interspersed with apt illustrations and good-natured humor marked his addresses. He knew how and when to tell a good story and make it serve a purpose other than to merely draw a laugh. In all his contacts, whether professional, civic, social, or business, his humanity stood out as a most prominent characteristic.

"How to live," says Herbert Spencer, "that is the essential question for us, not how to live in the mere material sense, but in the widest sense." To this question Professor Butz seemed in his life to have found an answer.



WILLIAM FRENCH

V

WILLIAM FREAR

March 24, 1860

January 7, 1922

DR. FREAR came to The Pennsylvania State College two years before the establishment of the Experiment Station. Having served in the United States Department of Agriculture he was familiar with agricultural problems and investigations. He brought with him an acquaintance with the personnel of the Department at Washington which greatly assisted him during his life. His broad general training and interest put him in contact easily with all departments of the College. The experiments which had been conducted and which were continued by him established a continuity of activities in agricultural investigation on which the Experiment Station could be established more easily. Thus there was no break or radical change of program but rather a gradual mergence and expansion. His importance as a connecting link between the old and the new at that time is hard to estimate.

William Frear was born in Reading, Pennsylvania, March 24, 1860, the son of a Baptist minister, the Reverend George Frear, and Malvina (Rowland) Frear. The father was descended from Hugo Frear, a French Huguenot who settled in New Paltz, New

York, in 1677. William attended the public schools of Reading and Norristown, Pennsylvania, where his father held pastorates, and later, when the family moved to Lewisburg, Pennsylvania, he entered Bucknell University from which college he received the degree of Bachelor of Arts in 1881.

When he entered college, it was his intention to become a civil engineer. During his course of study, however, he became more interested in chemistry and the natural sciences, which led to his appointment as an assistant in these subjects at his Alma Mater immediately after his graduation. He took graduate work at Harvard and the Illinois Wesleyan University and received the degree of Doctor of Philosophy from the latter institution in 1883. During all his student life, both in public school and in college, his work was characterized by high scholarship, but he was not by any means a recluse. He was interested in college life and took an active part in a serious-minded sort of way generally as became the son of a local pastor. Although the most of his life was spent in State College, he never lost his interest in Bucknell.

After receiving his doctorate he was appointed Assistant Chemist to the United States Department of Agriculture under Dr. Harvey W. Wiley. (Dr. Wiley has kindly contributed for this sketch an article on his personal recollections.) While with the United States Department of Agriculture, Frear conducted investigations with beet sugar and cereals. In 1885 he was appointed Assistant Professor of Agricultural Chemistry at The Pennsylvania State Col-

lege where he took up his work in September of that year. In 1886 he was promoted to the rank of Professor and served as head of this department until 1908 when the department was divided and his title was changed to Professor of Experimental Agricultural Chemistry. This position he held until his death. He was Vice-Director and Chief Chemist of the Experiment Station from its organization to the time of his death. As such he was in charge of all the analytical work.

Dr. Frear's first published report to the President and Trustees of The Pennsylvania State College was dated December 11, 1886. It contained the records of the experiments of the years 1885 and 1886. Apparently the results of the year 1885 were not published separately. Prior to that time, he had also published Agricultural Bulletins Nos. 12, 14, 15, and 16. Bulletin No. 13, while published as an Agricultural Bulletin, was an outline of the new course in Mechanic Arts just then established. Dr. Frear not only wrote the report for 1885 and 1886, but he had conducted all the experiments on which it was based as well. Besides having charge of the general fertilizer plots, which had been planned and laid out on what was then known as the Central Experimental Farm by Professor Jordan in 1881, he was conducting a number of variety tests, germination tests, trials with new forage crops, plow tests, carrying on feeding experiments, making fertilizer analyses, and keeping milk records. Dr. Frear was also directing the work of the Eastern Experimental Farm.

The first agricultural bulletin was issued by Professor Jordan, November 15, 1882, an edition of 3,000. The first four agricultural bulletins of the College were on fertilizers. All the bulletins up to and including No. 11 were by Professor Jordan except No. 7 which was by Professor Buckhout. The sixteen agricultural bulletins published prior to the establishment of the Experiment Station were collected by Dr. Frear and reprinted in the Annual Report of the College for 1886.

At the time the Agricultural Experiment Station was established under the Hatch Act, June 30, 1887, Dr. Armsby was elected Director and Dr. Frear was elected Vice-Director and Chemist. Dr. Armsby did not reach the College until about January 1, 1888, and Dr. Frear was Acting Director in the meantime. He wrote practically all of the Annual Report of the Experiment Station for 1887 and continued to carry on the experimental work with one assistant. Dr. Armsby himself says in his report that the "details of administration devolved on the Acting Director, Dr. William Frear . . . Consequently the Director's part in the preparation of these reports has been necessarily limited chiefly to the introductory paragraphs while the accounts of the experiments have been prepared, as the experiments themselves were conducted, by Dr. Frear who is entitled to whatever credit may be due to the work for the year." The lines of investigation were practically the same as those of 1886.

Bulletin No. 1 of the Experiment Station, issued

October, 1887, was by Dr. Frear, but contained an announcement and introduction by the director. It was mainly devoted to "Studies Upon the Composition and Development of Soiling Crops." Preceding this article, however, it contained a "Historical Sketch of the Agricultural Experiments Conducted by The Pennsylvania State College from 1857 to 1887."

In 1887 he took over the weather observations which had been started by Professor Waring about 1857. For some reason they were discontinued after Professor Waring's resignation but were resumed by Professor C. A. Smith, Professor of Chemistry, in 1878. Upon Professor Smith's resignation in 1882 they were taken over by Professor I. Thornton Osmond, Professor of Physics. In order better to connect them with the agricultural experiments, they were transferred to the Department of Agricultural Chemistry in 1887.

Concerning the experiments conducted by the College prior to the organization of the Experiment Station, Dr. Frear closes his historical article with the following paragraph:

"An examination of the lists of experiments reveals a surprising number and range of investigations, unequalled by any other similar institution in the United States. It is true that, owing to existing conditions, many of the experiments were necessarily incomplete; but, on the other hand, it will be noted that there has been a constant effort to remedy this defect, and, in consequence, the College may justly claim that in the unity, continuity, and control of

the principal investigations conducted here within the past decade or two she has no equal among similar institutions. It may also be noted that this college was one of the first to issue bulletins—as distinguished from the fuller reports—for free distribution, showing in brief the results obtained in the course of experiment.”

Dr. Frear’s ability and scholarship were recognized throughout the State and Nation. He was looked to as an authority on all questions involving food chemistry, fertilizers, lime, and tobacco. As chemist of the Dairy and Food Commission he was most active in the framing of laws for the protection of the public. His knowledge of English, the facility with which he wrote, and the accuracy of the language of the Pennsylvania Food Laws, have made them a model for other states. One of his friends and co-workers says of him:

“There are no means of determining the value and importance of his work in connection with the various state and government agencies. Officials everywhere placed great reliance upon his knowledge of scientific matters and the results of his investigations in field and laboratory. For these reasons his services were in constant demand in organizations not connected with the College.”

For example: He was appointed Chemist of the Pennsylvania State Board of Agriculture in 1888 and served to 1919 when the Board was abolished. He had charge of the fertilizer analyses of Pennsylvania from 1888 to 1919. He was Chemist of the

State Department of Agriculture from its organization in 1895 and was Chemist of the Cattle Food Control from 1902 to 1905. He edited "Agricultural Science" from 1892 to 1894, and was on the Board of Editors of the "Journal of the American Official Agricultural Chemists" from 1920 until his death. He was Secretary of the Society for the Promotion of Agricultural Science from 1893 to 1895 and was its president in 1903. In 1900 he was appointed Chemist of the Food Standards Committee of the U. S. Department of Agriculture and was Chairman of the Joint Committee on Food Definitions and Standards.

He was an extensive reader, not only of technical literature but of general literature as well, and few men had the accurate knowledge of the English language which Dr. Frear possessed. While his services were more or less technical and his vocabulary extensive, he made use of this equipment only for the sake of accuracy of expression.

Harry Hayward of the N. W. Ayers Company, who was associated with him from 1894 to 1902, describes Dr. Frear as:

"A good mixer with a sympathetic and pleasing personality; self-confident and self-reliant; a willing and conscientious worker; a leading authority in the practical aspects of agricultural chemistry."

Dr. Frear was a fellow of the American Association for the Advancement of Science, a member of the American Chemical Society, the Academy of Political and Social Science, Franklin Institute, Philadelphia,

and the Washington Academy of Science. He was also a member of the fraternities, Phi Kappa Phi, Alpha Zeta, Phi Kappa Psi, and Alpha Chi Sigma, and of the Cosmos Club of Washington. In Masonry he served as Master of Bellefonte Lodge No. 268 in 1907 and was a Past Commander of Constans Commandery. He was also a member of the Consistory of Williamsport. For a number of years he was a member of Vieter Grange at Oak Hall Station.

In addition to teaching practically all of the agricultural chemistry until 1908, and supervising all agricultural analyses, he had time to give much personal attention to the Experiment Station work and particularly to new projects. As chairman of the Committee on Research of the Experiment Station it was his province to criticize and pass upon the outlines and plans of all proposed projects. He always took a great interest in the men that worked under him, encouraging them to advance, giving them all the assistance possible. He regarded the advancement of his men as a particular part of his work.

The weather records, as already stated, were kept in his department after 1887 and his special study of the subject of meteorology made him an authority on the climate of State College. Meteorology was one of the subjects he taught during all his active teaching career and in which he was keenly interested.

Through his membership in the Committee on Food Definitions and Standards, he was brought into contact with the large food manufacturing interests of

the country, and was held in high esteem by the manufacturers and the manufacturing chemists.

His services as a speaker before chemical and agricultural meetings were in demand. On account of his wide knowledge and his ability to analyze a problem thoroughly, he was frequently called into council of state and national officials and into conferences of manufacturing and industrial chemists.

Dr. A. C. True, Director of the Office of Experiment Stations of the U. S. Department of Agriculture during most of the time that Dr. Frear was Vice-Director of the Pennsylvania Station, writes:

"Dr. Frear was of a more nervous type than Dr. Armsby, more critical and outspoken, with a fondness for business affairs. This led him to take great interest in the control work of the experiment station and it was for this kind of scientific work that he seemed best fitted."

His tendency to go into a problem in detail was so great that he seldom answered a question "yes" or "no." The writer frequently had occasion to consult him on a variety of subjects, but about the only definite specific advice he ever got was to vote the regular Republican ticket.

Dr. Frear was a skilled raconteur and, whether fact or fiction, his stories were always clean, interesting, and apt. He also had unusual musical ability and enjoyed considerable local reputation both as a pianist and a singer.

Although a Baptist by affiliation, as well as by tradition and education, he attended the Presbyterian

church in State College where he frequently sang in the choir and often served as pianist or organist. He was a generous and loyal supporter of the church and it was due to his influence more than to anything else that the community was not burdened with the support of a Baptist organization before the population and membership warranted it. He was broad-minded enough and religious enough to worship with one organization while holding membership in another.

He was married to Miss Julia Reno of Greenville, Kentucky, July 17, 1900, and his family life was most happy. He was most gracious in manner, very considerate of all with whom he came in contact, fond of the society of women and, although he did not marry until approaching middle life, he took a great delight in being a companion to his children. After the birth of his children, he built a new home that he might have a more commodious house in which to enjoy the companionship of his family, his books, and his music, which he loved so well. Here he died January 7, 1922. Although he walked to and from his office almost daily, and generally twice a day, he had known for more than a year that his hold on life was precarious and had made a special effort to have his work in order. His two sons and two daughters are being educated at the college he served.

Dr. Frear's interest in the College led him to realize that if it was to grow and fulfill its purpose the community must develop with it. It had been established in the open country and a village was growing

up around it in a desultory sort of way. Seeing the necessity for more modern attributes and conveniences he was active in practically every move for improvement. Among other things, he helped to promote and build the University Inn to serve as a home for unmarried members of the faculty. He was a director of the first bank in State College from its organization; he helped to organize the first building and loan association, the State College Water Company, the Hillside Ice Company, the first electric light company and others. He aided in establishing a transportation company which materially improved the facilities always inadequate for traveling to and from the College.

While he would be considered a successful business man, it must not be thought that all these ventures were personally profitable. He often seemed to have the welfare of the community as much in mind as his own financial interests.

In an article in the *La Vie* of 1922, Dean R. L. Watts of the School of Agriculture says:

“The writer of this Memorial was privileged to know him as a teacher, investigator, administrator, author, and lecturer, and in all of these respects Dr. Frear rendered tremendous service to The Pennsylvania State College and to the State and Nation, and was held in the highest esteem.

“But, let us now consider him as a man, as a friend, as a neighbor, as a fellow-townsmen. From the day of his arrival in State College until the time of his death, he manifested the keenest interest not only in

the college, but in the entire community. The public schools, churches, water system, street improvement, electric lights, Chamber of Commerce, in fact every movement of importance to the welfare of the community had his wise counsel and active support.

“With all of our admiration of Dr. Freear as an eminent scientist, we admire another side of the man still more; his splendid Christian character and fine human qualities that left an indelible impression upon the lives of all those who knew him, and upon thousands of people who counted him as their friend.

“His home life was indeed beautiful. He was most devoted to his family, provided for them an extensive library of the best literature, participated daily with the family in musical selections, and enjoyed games with the children.

“As a counselor, whether on scientific, public or personal matters, few men were his equal. He had the rare ability to analyze a problem, to see all sides of the question and to lead the thoughts of the inquirer into channels that would help him to form proper conclusions.

“He possessed to a remarkable degree the admirable qualities of kindness, cheerfulness, patience, charity, and thoughtfulness. No one ever was associated with him in any capacity who was not helped in some way. A prominent scientist, who was his laboratory assistant twenty-five years ago, writes:

“He gave me every advantage, offered me the use of his large private library, and helped me in hundreds of other ways. By dropping a friendly hint

here and a caution there, he exercised a greater influence upon me than those who followed a more forcible decisive policy.' "

Professor I. Thornton Osmond thus recollects him:

"Dr. Frear, bachelor when he came to the College, fitted up his living room in 'Old Main' with tall filled bookshelves, not only around the walls but in the center, and lived among them, absorbed in his work which won for him a leading position in those subjects which he made his specialities. Yet, withal, he was a pleasant member of the social life of the College."

Dr. Harry J. Patterson who was his first assistant as Chemist of the Pennsylvania Experiment Station, and who afterward became Director of the Maryland Experiment Station and President of the Maryland Agricultural College, in a statement prepared for this article, says:

"I really began my investigational work under Dr. Frear, and the lessons which I learned in the necessity for thoroughly carrying out all details, the making of careful observations, and recording them, have proved invaluable. Dr. Frear stands out in my mind as being more thorough than any other man with whom I have come in contact in keeping careful records, not only in his public and investigational affairs, but also his private records. When I was his assistant in the Experiment Station at Penn State I took care of all of these details for him in his absence, and I know that the experience and training which I gained in that way taught me very valuable lessons,

although at that time I am sure that I did not realize that he was giving me some exceptional advantages and opportunities. It was also my privilege to be associated with Dr. Frear for two years as a student and for about two years as assistant chemist in the Experiment Station. After leaving college I met him frequently and we always had very pleasant professional and social relations.

“Dr. Frear’s influence in placing the agricultural investigational work in Pennsylvania on a high plane was very marked. His influence and contention in developing the fertilizer and feed inspection work of the state, so as to have it conducted so as to be equitable to the manufacturers and at the same time fully protect the farmers, was of great value, and I doubt if either of these interests fully appreciate what he actually accomplished for them. The standing of the Association of Official Agricultural Chemists in both the commercial and scientific world is largely a result of the work which he did for this association. He was very alert and quick to size up a situation and this, with his unusual sense of fairness, was a great factor in steering many matters to a satisfactory conclusion.”

Mr. George C. Hutchinson, a graduate of the College, and for many years a Trustee, a farmer, a member of the State Board of Agriculture and an employee of the State Department of Agriculture after its establishment, who was more or less in contact with Dr. Frear’s work during his entire connection

with the agricultural interests of Pennsylvania, says of him:

“Dr. Frear as chemist to the Department of Agriculture was particularly valuable in the fertilizer work. His knowledge of chemistry and the study of the soil, especially, was helpful. He was regarded as an authority on agricultural chemistry not only in Pennsylvania but in the nation. His help in preparing the law covering the manufacture and sale of fertilizers was most useful. His knowledge was a great contribution to the legislative committee. He also prepared a lime law controlling the sale of limestone for agricultural purposes. State College never appreciated what he did for it. He was very particular that no mistakes be made and that both parties receive fair treatment. He was thoroughly honest and his accurate knowledge of the English language and his ability to use it kept the law practically free from ambiguity and prevented many contentions as to its meaning. As an institute worker he was regarded as an authority on fertilizers and agricultural chemistry in general. He placed the College in a favorable position before the farmers of Pennsylvania. As a food expert he had no superior. He did a great work in attracting the people to the benefits of pure food. He was often called as a witness in court and was never confused in his testimony. As a member of the committee on Definitions and Standards he had probably as much to do as anyone in framing the Pure Food Law.”

In response to an inquiry from the writer, the

editor of the *Oklahoma Farmer* and former Director of the Oklahoma Experiment Station, Hon. John Fields, writes:

"I took agricultural chemistry from 'Billy' Frear in 1890, and worked under him as assistant chemist of the Experiment Station from 1891 to 1895. I was thus brought into close touch with him, and our relations were very pleasant. He was always busy and digging away at things which helped to develop chemistry in its relationship to agriculture. He was also active in the affairs of the community."

Among the most appreciative tributes are the following:

C. A. Browne, Chief of the Bureau of Chemistry, U. S. Department of Agriculture, contributes the following memorabilia especially for this sketch:

"I first came to know Dr. William Frear in the early part of the year 1895, shortly after I went to State College to teach chemistry as an assistant to the late Professor G. G. Pond. We were both boarding at the University Inn and our acquaintance began from casually meeting each other at the table during meal time. It was not, however, until June, 1896, when Dr. Frear engaged me to work for him as a temporary assistant chemist in the analysis of fertilizers that my actual personal relationship with Dr. Frear may be said to have begun; the experience which I acquired under his direction as Vice-director and chemist of the Experiment Station during the next six years determined my future career as an agricultural chemist. Dr. Frear had a singular apti-

tude in knowing the individual capacities of the men who worked under him, and in assigning to each the kind of work for which he was best qualified. In addition to the routine work upon fertilizers Dr. Frear interested me in several extended research problems in Agricultural Chemistry. Shortly after my connection with the Station, experiments were begun by a farmer in the southern part of Pennsylvania upon the growing of sugar beets and the Experiment Station made analyses of these beets as to their richness in sugar. Owing to my previous familiarity with the polariscope, Dr. Frear assigned the chemical examination of the sugar beets to me and in this way my interest in the chemistry of sugars and carbohydrates was first aroused.

“Dr. Frear as State Chemist was very active in the crusade against food adulteration. He gave me free access, even during his absence from the Station, to his extensive private chemical library and in this I was particularly fortunate, for his collection of works upon agricultural chemistry was very complete.

“My chemical associations with Dr. Frear were closer and more intimate than with any other chemist under whom I have worked. He loved his science deeply and was successful in imparting this devotion to agricultural chemistry to those who came in contact with him. He was a man to whom I went frequently for advice and his suggestions were always given in a kindly, friendly spirit. He was generous in the praise which he gave to his assistants and co-workers and took pleasure in their advancement.

Socially, he was one of the most pleasant men whom I have ever met and the renewal of our acquaintance on various occasions, after I left State College, at Washington, New York and elsewhere, was most delightful. He was fond of a good story, even at his own expense, and a merry twinkle always came to his eye just in advance of the point which he wished to make.

“I think frequently of my last conversation with Dr. Frear on September 24, 1921, during a short visit which I was making at State College. I saw him for a short time in his office at the Station Building and Mrs. Browne and I took dinner at his home that evening. After the dinner, Dr. Frear took me to his library and after lighting our cigars we exchanged experiences and reminiscences until a late hour. He spoke doubtfully about the sickness of Dr. Armsby, who, only a few days before, had suffered the paralytic stroke which was to carry him away, and mentioned that his loss would be irreparable. Knowing my love for old scientific books he produced some lately acquired chemical volumes of ancient typography and we looked over the quaint illustrations together with much interest. He discussed the results of recent experiments which he had been conducting upon the action of lime on soils.

“In the agricultural chemical research Dr. Frear will probably be longest remembered for his publications upon the liming of soils, a subject in which he was interested during the whole of his career. His most constructive work, however, was unquestionably

the pioneer service which he gave to the establishment of food standards and pure food legislation. To this work he gave untiring energy, even after the symptoms of his fatal illness were fastening upon him. In his devotion to high ideals and to public service in every worthy cause the memory of Dr. Frear will be a constant inspiration to all who knew him whether as scientist, teacher, friend, or citizen."

Dr. Harvey W. Wiley, Chief Chemist of the U. S. Department of Agriculture, 1883-1912, has kindly prepared the following personal recollections of Dr. William Frear:

"I was in close touch with Dr. Frear from the time he entered the Bureau of Chemistry, soon after I became Chief thereof, up to the date of his untimely death. Dr. Frear came into the Bureau of Chemistry before the days of the Civil Service. I imagine he was recommended for the position by some member of Congress; at least, I had no voice in his selection. Judging by the result, I do not consider that any misfortune. Dr. Frear was sent over to me with the notice of his appointment and assignment to the then Division of Chemistry. He came immediately under my personal supervision. From the very beginning I was struck with some of his prominent characteristics. First of all I marked his eagerness to do something worthy. He frankly told me that his training in quantitative analyses was not very extensive, and he begged me to bear with him while he improved his technique. I was pleased with his spirit and very readily fell in with his ambitions. I helped him right

along with his quantitative work and he rapidly improved his technique in that line. As soon as we could rely upon his results, I put him to work on food analysis, to which he was attracted in a very earnest and enthusiastic way.

“Dr. Frear at that early date in his professional career manifested that orderly arrangement in all that he did which became so great a factor in his future success. The Division of Chemistry at that time was a small affair. I doubt if there were a dozen persons employed in it when Dr. Frear entered. Nevertheless, our work in the study of food adulteration was fully organized. Dr. Frear was personally agreeable to everybody in the Bureau, and our regard for him increased day by day as long as he remained with us. I felt certain that when he was called to a more responsible position in the Agricultural College of Pennsylvania that he would make a record of which we all would be proud.

“When the Bureau of Chemistry organized its committee on Food Standards, I realized that the ideal chairman of that committee would be Dr. Frear. As I had the selection of this committee entirely in my own hands, he was appointed to that responsible position. He also acted as Assistant Secretary to Dr. Jenkins of the committee, and kept our records and papers always in order. I hope that the services of Dr. Frear in this capacity will be realized more and more as the years go by. His work was phenomenal. His colaborers on this committee were as follows: Secretary, Dr. E. H. Jenkins, of the Agricultural Ex-

periment Station of Connecticut; Dr. M. A. Scovell, Director of the Kentucky Agricultural Experiment Station; Professor H. A. Weber, Chief Chemist of the Agricultural College of the University of Ohio, at Columbus, and Dr. H. W. Wiley, Chief of the Bureau of Chemistry. All of his co-workers appreciated Dr. Frear's wonderful power of orderly research.

"Dr. Frear was an early and enthusiastic member of the Association of Official Agricultural Chemists, and contributed much valuable work to that organization which was perhaps unique in the history of agricultural chemistry in the world. After I left the public service on the 15th of March, 1912, I still kept in intimate touch with Dr. Frear's activities as vice-director and chemist of the station, and as one of the chemists of the Pennsylvania Food Control. This work was in direct line with his early experiences in the Bureau of Chemistry in research studies of food adulteration.

"Dr. Frear's early death was not only a great loss to agricultural chemistry and food science, but also a keen personal bereavement. With his death, three of the original members of the Food Standards Committee, namely, Dr. Scovell and Dr. Weber, have passed on to the long, long trail."

Dr. Frear was one of the most versatile of men. Graduating from a classical course in college, he devoted his life to scientific research and teaching. His native ability was unusually well balanced, and he kept it, too, by his varied interests. The fluency and

accuracy with which he wrote was too great to be the result of a mere literary or classical college training. His vocabulary was noted for its breadth and variety as well as the skill with which he used it. While at times in his speech he may have seemed verbose, he never resorted to slang or expletives and it could not be said of him that he "darkened counsel with words without knowledge."

He probably would have made an outstanding lawyer. His legal mind is shown in the legislation which he framed, in the definitions of foods, drugs and products which he formulated, and in his success as a witness in courts where his services were often sought.

Such are a few of the memories surviving of this pioneer agricultural chemist and experiment station worker. Some of these may be brightened as the years go by, others may be dimmed, but it was just such broad activities and interests as are here noted that made the early work possible.



JOHN HAMILTON

COLLEGE OF THE HOLY TRINITY

VI

JOHN HAMILTON

February 19, 1843

July 5, 1921

THE financial affairs of a public institution always constitute a difficult problem. This seems to be particularly true of colleges. The duties of the executive and the teachers tend to the development of other than business interests. The income of a college is seldom sufficient for its needs, especially if its program is ambitious. State institutions are usually no exceptions. They are subject to the additional danger of the business management being left to political appointees. The Pennsylvania State College has been, for the most part, exceptionally free from disastrous business transactions notwithstanding the fact that its land-scrip was sold at a sacrifice. While money was always scarce, the College in general made the best use of the means at hand. In spite of all that could be done, debts accumulated. It was largely through the industry, business ability, and integrity of one or two men that the College was kept going through some of its darkest days. Of these men, the subject of this sketch was one. As Professor of Agriculture, Business Manager, Treasurer, and Trustee he served the College continuously, faithfully and unselfishly for more than thirty-five years.

John Hamilton, the first Professor of Agriculture of The Pennsylvania State College elected as such, was born February, 19, 1843, at Fermanagh Farm, near Mexico, in Juniata County, Pennsylvania. His father, Hugh Hamilton, was born in this house and also his grandfather, John Hamilton; and from it his great-grandfather, known as John Hamilton of Fermanagh, went, at the head of a company enrolled and paid by himself, to the support of Washington during the Revolution. On the maternal side as well he came of people noted for their uprightness, integrity, and public spirit. His mother, whose maiden name was Sarah Gettys McDowell, died when he was young.

The family had always owned, lived on, and loved the land. It was natural then that John Hamilton should have viewed with great regret the tendency of the better element away from the land and that he should have given his best efforts toward the betterment of rural conditions and the education of farm people.

His own education began in a small school near Fermanagh Farm, and continued at Academia and Airy View Academy, Port Royal. His father prepared him for college in Latin and Greek, he himself being a graduate of Jefferson College at Canonsburg and the grandfather a graduate of Dickinson College at Carlisle.

As a youth John Hamilton had a liking for military affairs and at the age of sixteen or seventeen he joined the Juniata Cavalry. His company offered its service to the state, April 15, 1861, and was sworn

into the United States service July 24, 1861, as Company A, 1st Pennsylvania Reserve Volunteer Cavalry, and served to September 9, 1864; all of this time in the Army of the Potomac. Although Hamilton participated in practically all the battles of his troop, he was never wounded. He was with General Taylor at Gettysburg. During his service he rose from private to the rank of Sergeant-major. He was always loyal to the cause for which he fought and to his comrades, and kept in contact with them after the war through the G. A. R. and the Union Veterans' League.

After the war, young Hamilton entered the Agricultural College of Pennsylvania, February 28, 1865, and was in college as a student until December 15, 1865. He took charge of the College Farm January 1, 1866, and continued in this capacity until February 16, 1869. He was appointed Professor of Agriculture in March, 1871, and again took charge of the College Farms. His proficiency in Military Science led to his appointment as Commandant of Cadets at the beginning of the winter term of 1869, while he was a student, and continued until the end of the spring term of 1873. He was graduated in the Class of '71 with the degree of B.S. The degree of M.A.S. was conferred later.

In 1880 he resigned as Professor of Agriculture and was succeeded by Professor W. H. Jordan. In order to understand the problems and the work with which he was confronted it is necessary to discuss some of the conditions of the College at that time.

Soon after the establishment of the Farmers' High

School as the Agricultural College of Pennsylvania, the state invested \$43,886.50 of the proceeds of the land-scrip sales in what was known as the Central, Eastern and Western Model and Experimental Farms. The Eastern farm was located in Chester County and cost \$17,750.00, the Central in Centre County adjacent to the land of the Agricultural College and cost \$8,000.00, and the third in Indiana County and cost \$18,136.50. The Central and Western farms were established on April 1, 1869. The Eastern farm had been established the year before. It is to be recollected that these farms were distinct from the "College Farms."

The stock for the Eastern farm was furnished by the Chester County Agricultural Society and others in the eastern section of the state. The stock for the Western farm was furnished by the Indiana County Agricultural Society and others in the western section of the state and the stock for the Central farm was furnished by McAllister and Beaver, and Thompson, McFarland and Company of Centre County. At the time of the establishment of the Eastern farm, a certain amount of stock and implements was transferred from the College farm to it.

T. P. Walker was the first superintendent of the Western farm, Wm. P. Huey of the Central farm, and Thomas M. Harvey of the Eastern farm. Wm. P. Huey is recollected as a large jovial fellow, pleasant to all, a great story teller, not particularly industrious but apparently conscientious and with some executive ability.

A resolution of the Board set aside the sum of \$6,000 each year for the conduct of the Model and Experimental Farms; "Two thousand dollars to each, drawn from the revenue derived from the endowment, twenty-five acres on each farm for experiment and the remainder of each to be farmed as model farms."

President Burrowes as Professor of Agriculture in acknowledging the reports of the superintendents of these farms for 1869 says of the report on the Central farm that he is "happy to say it corresponds with the program described" and with his instructions as Professor of Agriculture and "answers fully the requirements of the Board." Of the report on the Western farm he says, "although somewhat inaccurate and defective, substantially conforms to the requisitions of the Board." Of the report of the Eastern farm he says, "Mr. Harvey's report does not correspond with the program prescribed by the Board nor with the instructions given from time to time." It was the intention of the Board to have the same experiments conducted in the same way on all three farms. The local committee of the Eastern farm ignored the instructions and conducted such experiments as they saw fit to initiate. It seems that a number of organizations in the eastern part of the state were each trying to direct what should be done. He says, however, that "the experiments have evidently been conducted with great care, and independent of this disregard of the instructions, are reported in a manner highly creditable to the industry and ability of the superintendent."

Dr. Burrowes published an outline or plan of the experiments in order that any visitor might acquaint himself fully with the work. The books were to be open, in order that the visitor might find there recorded, as he says, "what has been tried, the manner in which it has been tried, and the results. You will find there what is being tried with the program and anyone can, *himself* and *without a guide*, visit any plot and there examine *what is growing* thereon and the program will fully inform him *what has preceded* and *what is to succeed* the growing crop, and he will there see also *what is yet to be done* and the *manner* in which *it is to be done* and the full extent of the program prescribed, and the knowledge of *one farm* is a knowledge of all.

"When the Board prescribes the *essentials of what is to be done* and the Professor of Agriculture instructs *how it is to be done*, the Superintendent has only *to see that it is done in the manner directed*."

In the report for 1870, President Burrowes stated that "owing to the fact that the Eastern farm had been put in operation one year before the others and under the supervision and control of several societies and clubs in that part of the State, it has been found that the form and manner of proceeding and reporting must be, in several respects, different from those enjoined by the central authority." It was expected that thereafter the Eastern farm would follow the same program as the others but the expectations were not realized.

He further raised "the general and very important

question, what is a primary sphere of action of an experimental farm. For, until that is clearly understood and independently acted upon, the whole attempt will remain in a state of uncertainty and the noble enterprise may be positively broken down by undertaking too much and doing nothing thoroughly." He mentions three classes of experiments: (1) Experiments on rotation of crops and modes of agriculture; (2) Difference and relative merits of fertilizers; (3) Experiments upon different varieties of grain, seeds, and vegetables.

Dr. Burrowes was a man of broad training and experience, who had been State Superintendent of Public Instruction. His standing in the state contributed to the importance of the College in the mind of the people. His son, Tarry Burrowes, had charge of student labor, and was a large, rough fellow who handled the boys by main strength.

It was Dr. Burrowes' custom each fall to go on a hunting trip of one week in the mountains, usually about Bear Meadows. On these trips, he generally took the entire student body with him, and the College virtually was moved to the Meadows for a week of sport. On one of these trips Dr. Burrowes contracted a cold from which his death resulted.

Dr. Burrowes died in 1871 and was succeeded by the Reverend James Calder as President and Professor of Mental and Moral Science, and John Hamilton as Professor of Agriculture.

Dr. Calder was a minister who, although a native Pennsylvanian, was, at the time he was elected, Presi-

dent of a small college in Michigan. He seems to have been a good school man, but inclined to the abstract rather than the concrete and was an indifferent business man, which fact led to the appointment of John Hamilton as Business Manager of the College.

At that time the classes were known as Freshman, Junior, Agricultural, and Scientific instead of Freshman, Sophomore, Junior, and Senior. While the third year was known as the Agricultural class, it may be said that practice in agricultural work on the College farm was given to the students of the two preceding years and, so far as the printed course of study would indicate, the third year was no more agricultural than was the first, second, or fourth. Students were admitted to the first or Freshman year who had not completed what is now the eighth grade or common school subjects. During the first term of this year were then taught orthography, U. S. history, reading and elocution, penmanship, English grammar, political geography, and arithmetic—mental and written. Elements of algebra and Latin grammar were also taught.

The college year was divided into two terms; the spring term of twenty-four weeks beginning on the third Monday in February and ending on the last Friday in July, and the fall term of sixteen weeks beginning on the Monday after the last Friday in August and ending on the third Friday in December. There was, therefore, a summer vacation of four weeks in August, and a winter vacation of eight weeks in December, January, and February. The total num-

ber of students enrolled in the fall of 1870 was 59; in 1871, 39; in 1872, 67.

Separate reports of the various departments appeared first in the Annual Report for 1872. The course of study was revised by President Calder and three four-year courses were offered, namely, Agricultural, Scientific, and Classical, with a preparatory year for each. The first departmental report of the Professor of Agriculture is dated December 1, 1872, and signed, John Hamilton, Professor of Agriculture. The opening sentence states that it is submitted in accordance with the request of the Board of Trustees requiring of the Professor of Agriculture an annual report of the operations of his department. He states that he entered upon his duties as Professor of Agriculture in April, 1871; that he found the three farms known respectively as Eastern, Central and Western Model and Experimental Farms equipped and each in the charge of a superintendent who had general oversight and was instructed to carry out a system of experiments prescribed by the Board of Trustees. On visiting the farms he discovered that on the Eastern farm the program had not been complied with and instead of having the same experiments conducted on the same plot of ground year after year, as the program of the Board required, new plots were selected each year. "The present superintendent of the farm who took charge on the first of April, 1871, has entered heartily into the plan of the Board and has since laid out all the tiers of plots in accordance with the program." . . . He further says, "The opera-

tions of the Central farm for the past two years has been very satisfactory." . . . "There is on this farm, each year in July, a trial of reapers, mowers and plows continued for three days. These trials excite much interest and are well attended by farmers and others interested in agricultural machinery." (This occasion seems to be the progenitor of the "Farmers' Weeks" which were held at this College and many others at a much later date.)

The Western farm at that time was in charge of Mr. A. G. Hamilton but, so far as is known, he was not related to John Hamilton, Professor of Agriculture. Professor Hamilton called attention to the efforts made by Mr. A. G. Hamilton to pay off the debts contracted by his predecessor. Mr. A. G. Hamilton resigned in September, 1872, and Thomas C. Hood was appointed in his place.

In this report Professor Hamilton discusses the difference between the *Model* and *Experimental* farms. It seems there had been some adverse criticisms on the conduct of the farms. He says, "These arise from the incorrect views of what constitutes a model and an experimental farm. A model farm is a *profitable* farm, and it is not such a one as has arrived at its present state at a cost of three or four times its value. . . . The experimental farm will, undoubtedly, be an expense, no matter how judiciously it may be conducted, but this expense does not, as is commonly supposed, arise so much from the failures of the experiments as from the great care that is necessary in preparing the ground, sowing the seed, and harvesting

and threshing the crops, so as to conform to a previously prepared plan. Much money has been expended in satisfying mere curiosity and in carrying on a multitude of useless or ill-judged experiments that might have been saved for useful purposes had the experimenters been less hasty, and have only acted after the most careful inquiry and reflection."

It may be of interest here to state that the annual report of each of these farms contained not only a report of the results of the experiments but gave an inventory of all stock, machinery, and implements on hand, and contained a more or less complete diary of work done.

The annual Harvest Home was one of the features of the College and was held the last week in August. In the announcement it is stated that the College will be open to its friends and such entertainment as can be given will be at their service.

"Persons included in this invitation are the parents or guardians of all students on the roll during the session, graduates of the College, editors of the newspaper press and judges on the trial of implements:—all of whom, on their arrival, will register their names and receive a ticket, which will secure the hospitalities of the Institution." This announcement was made in the annual report for 1872 and again in the annual report for 1873. A student plowing contest was held July 17, 1874. There were twelve entries, three of which gave up before finishing the plot which was one-eighth acre. First prize was won by J. W. Hes-ton who afterward became Head of the Preparatory Department.

The report of the Professor of Agriculture states that the Central and Eastern farms carried on, in addition to those prescribed, numerous experiments outside the program. These, for the most part, "have special reference to the particular localities in which the farms are situated. The financial reports of the Eastern and Central farms show them to be in a flourishing condition, they being fully equipped with stock and implements; also free from debt and having balances on hand." The Western farm was in better condition in respect to its appearance and finances than when reported the previous year. About \$800 of the debt had been paid, and a great deal had been done in the way of improving the land. In order that the affairs might be brought out of debt, he recommended that notes of the College to the amount of \$1,500 made payable by the farm out of its installments, in three yearly payments of \$500 each, be given to the local trustees for negotiation.

The appropriations to the various farms had been reduced to six hundred dollars a year. The Eastern farm, under the superintendence of Mr. John I. Carter, was carrying out the program of the Board in nearly every particular. The Western farm was showing some improvement. This farm had been in debt ever since its purchase by the College. In order to reduce the debt it was determined to rent the farm for 1877. It was, therefore, rented to Thomas C. Hood, the former Superintendent. The committee, at the same time, sold part of the land to the Indiana County Agricultural Society and purchased a strip

running through the middle of the farm which had formerly been owned by private parties.

The Professor of Agriculture having recommended that the plots on the Western experimental farm be plowed up, there was no report of that farm in 1875. The reports of the Eastern farm were rather extensive.

At this time there was a floating debt of the College which was being paid off at about the rate of \$6,000 a year. Professor Hamilton was also Treasurer and Business Manager.

In the report for 1876, Professor Hamilton states that the Central farm has been carrying out the program in accordance to that prescribed by the Board of Trustees; he also commends the work of Mr. Hood on the Western farm and says that the Eastern farm under the superintendence of Mr. J. I. Carter is maintaining its position of usefulness in the locality in which it is situated.

President Calder became active in the Grange or Patrons of Husbandry which was growing rapidly in Pennsylvania from 1873 to 1877. During his administration the College was heartily supported both by the County and State bodies. A report made to the State Grange which met at Bellefonte in December, 1878, was very favorable.

An extract from the minutes of the meeting of the State Grange held at Greensburg in 1880 immediately after Dr. Calder's resignation is less friendly. At the same time they ask "those trustees who are Patrons of Husbandry to look upon that office as one of great responsibility, to thoroughly acquaint them-

selves with the affairs of the College, and to set such an example of intelligent devotion to its management as will effectually terminate the abuses and omissions which are openly declared to now exist there . . . That we call upon the trustees of the College, to at once terminate the protracted and inexcusable deficiencies in the Department of Agriculture, and, particularly that henceforth they make that department second to none in the attainments, industry, and ability to teach, possessed by the professor who shall especially represent it."

It is very evident from the published minutes that a campaign for adverse criticism of the College had been conducted before the meeting, and that the resolution for the most part was carefully prepared in advance. It seems to have been largely a personal fight against Professor Hamilton because he did not see fit to join the Grange.

Professor Hamilton says in the report for 1879-80 that during that year he had not "found it practical to engage in giving classroom instruction to the extent that he was accustomed to in previous years." He did, however, give some instruction as well as oversee the farms. In that report he outlined some of the difficulties of one man teaching all agricultural subjects, and names some of the qualifications required of a teacher of agriculture. He contemplated resigning for he makes the following recommendation: "Get, if possible, such men as Professor Johnson of Yale or Dr. Caldwell of Cornell but do not get men of less ability. If the chair is weak, it will be de-

spised, and students will be deterred from entering upon the work."

The Eastern and Western experimental farms continued to cause more or less annoyance. Concerning the Central farm he says it "has a new Superintendent in the person of W. C. Patterson, a very competent and careful man. He was formerly Superintendent of the College Farm but by a slight increase in salary he was induced to take charge of both. I think that the work will be well done and the orders of the Board will be strictly adhered to."

"The new program was put into operation last spring. If possible, an experiment station should be established here and if a responsible man can be had as Professor of Agriculture, I think that this may be done at very little extra expense."

The early organization of the College and its agricultural work has been dwelt upon rather fully to show the program and changes that were made during Professor Hamilton's incumbency as Professor of Agriculture. He retired as Professor of Agriculture that year, 1880, but continued as Business Manager to 1886 and Treasurer to 1905. The report of W. C. Patterson, Superintendent of Central experimental farm, dated December 1, 1880, is made to Professor John Hamilton, Business Manager.

In 1874 Professor Hamilton was elected Treasurer of the College, which office he held for thirty-one years. When he resigned as Business Manager in 1886, he was elected to the Board of Trustees of the College and continued to 1890.

He was one of the original members of the Pennsylvania State Board of Agriculture and when the State Department of Agriculture was organized in 1895, he became Deputy Secretary and Director of Farmers' Institutes. In 1899 he was promoted to Secretary of Agriculture for the State. His term as Secretary of Agriculture expired in 1903 and he was immediately appointed Farmers' Institute Specialist of the United States Department of Agriculture and served in that position until 1914.

Good roads were always one of Professor Hamilton's hobbies, and, although a very busy man, he took the time to serve also as Road Supervisor in his township.

He did not at that time foresee the coming of motor cars and rubber tires and his idea of good roads was not that of the present Highway Department. He contemplated the use of horse-drawn vehicles with iron tires. Travel and transportation for distance was to be by steam or trolley and the roads were to radiate from the shipping stations. They were to aid the farmer in getting his produce to the railroad which would carry it to market. They were to be feeders for the railroads instead of competitors of them. His ideal road was macadam or telford which would afford a foothold for the horses.

After his retirement from the position with the United States Department of Agriculture in 1914, he was elected a member of the Borough Council of State College, where, owing to his interest and enthusiasm, he was made chairman of the street committee.

The streets of a growing town are always a problem difficult of solution. The advent of the automobile and the motor truck accentuated this at the particular time. Professor Hamilton gave freely of his time to this most difficult community problem. He instituted system into the improvement and upkeep of the streets, and although the funds available were painfully meager he was able to make a real start on plans that were continued in future development.

The organization of the Presbyterian Church in State College was almost entirely due to his efforts. He was made a ruling elder and during the remainder of his life was the most influential and probably the most active member of the Session. He donated the land for the first church building, and was always most liberal and loyal in support of all the church activities. He was frequently a delegate from Huntingdon Presbytery to the Synod and the General Assembly. He was intensely devoted to his church and community and worked unceasingly for both. He left a legacy in his will for the purchase of religious books for the College library. He always worked in a very systematic manner and had no patience with the desultory methods so often encountered in public service. He was conspicuously open and frank in all his relations and a fearless fighter for what he believed to be right.

October 27, 1875, he was married to Miss Elizabeth McFarland Thompson, daughter of Moses Thompson who had been his predecessor as Treasurer of the College. In 1879 he bought at \$100 an acre the one

hundred and eight acre farm of former Professor William Waring, adjacent to the College farm.

After Hamilton's appointment as Deputy Secretary of Agriculture, he built for his home, on this farm, a large house which for many years remained a landmark in the neighborhood. It was built of brick, with solid walls both inside and out. These made it very difficult to remodel, when after his death it was bought by a fraternity and converted into a chapter house. A few years before he built, an architect had added a large porch to one of the houses in the village, the first large porch that was built near Hamilton's house. Professor Hamilton was not pleased with the porch or with the idea, and when his own home was planned, it had no porches except such as were necessary to protect outside doors. The reason he gave was that he did not propose to build a porch for a "woman killer." He died at his home on this farm, July 5, 1921.

As Farmers' Institute specialist of the United States Department of Agriculture, Professor Hamilton was author of several bulletins and articles and was responsible for the origin and preparation of a number of illustrated lectures on agriculture and farm life for the use of institute workers and others. His most distinctive work, however, was the initiation and preparation of correspondence courses to be used in classes organized under local leadership. The best talent obtainable in the Department and in the various agricultural colleges was employed to prepare these courses, in which a great deal of valuable and in-

structive material was published. They failed of popular reception largely for two reasons: first, the difficulty of obtaining competent and responsible local leaders, and, second, because they came out at about the time of the passage of the Smith-Hughes Act and the organization of "vocational" agricultural courses in the public schools also came at about the same time.

Dr. E. W. Allen, Chief of the Office of Experiment Stations, after a brief biographical sketch in the Experiment Station Record of July, 1921, says:

"His unfailing interest and faithful service to the cause of Farmers' Institutes both in Pennsylvania and in the entire country, and as secretary for many years of the American Association of Farmers' Institute Workers, will long be remembered."

While Professor Hamilton was connected with the College as Treasurer and Business Manager there occurred a period of building activity. The Engineering Building, the Chemistry and Physics Buildings, the Botany Building, the Armory, the Women's Building, the Experiment Station and several dwellings for members of the Faculty were built, and Old Main was remodeled. Professor Hamilton served as chairman of the building committee of the Board of Trustees. The architect employed by the College proved inexperienced which made his work doubly heavy. He insisted, however, upon honest material and workmanship according to the strict letter of the contracts and specifications to the extent that nearly all the contractors lost money. His was a thankless task as he not only had the contractors to contend

with but often the architect and the college authorities were not in sympathy with his acts. Time has proved, however, that in practically every instance his judgment was best.

At one time, in order to economize, the Trustees abolished the position of Business Manager, and turned that work over to the President of the College at his request. Professor Hamilton withdrew his residence to Centre Furnace and gave his attention to other affairs. At the next meeting of the Board three months later, the position was reestablished and Professor Hamilton recalled to fill it.

The site of the Experiment Station, which virtually fixed the location of the School of Agriculture on the highest point of the campus, was selected by him and was held in the face of stormy opposition. No one today questions the wisdom of the choice.

Mr. George C. Hutchison of Warriors Mark, a graduate of the College and for a number of years one of its most active trustees and who was associated with Professor Hamilton during his entire direction of the Department of Agriculture, says of him:

“When Professor Hamilton was Deputy Secretary of Agriculture at Harrisburg, to which position he was appointed in 1905, he was particularly interested in good roads. He called to the Institute work the best workers he could find and was insistent that the subject of good roads be discussed on every program. Soils was also a subject that was required at all meetings. He sponsored the bill which repealed all road laws and the bill appropriating a million dollars for

country roads which was defeated by Grange influence. Professor Hamilton had a great vision of the future. He had no ax to grind and not many could see the future so well as he. He could work better alone or with a few people than with a body. He never courted popularity and was always willing to sacrifice popularity for principle.

“He was aggressive along all lines and wanted every man under him to do his duty and every dollar appropriated by the state to be used strictly as contemplated and accounted for.

“He did a great deal to harmonize the farmers and the College. His definition of scientific farming is typical of him, ‘the right way of doing things in agriculture.’ While farm management and agricultural economics were little heard of in his time, he was especially interested in them and strong for them. He was a successful farmer himself and did not believe that agricultural teaching was worth while unless it led to better farming and better living conditions on the farm.

“He never talked any nonsense, but prepared his address with great care when appearing before an audience and always brought something of interest. He was dignified and clean to the extent that some thought that he was hard to approach. He was liberal in his charities but never let one hand know what the other did. There was no display or show about him. He always dressed plain but dignified, usually in black or dark clothes with a white tie. He wore, habitually, the high-top boots which were the custom-

ary foot gear of 1880. In his late life he had difficulty in getting these boots, but for the most part they were made by an old boot maker in Bellefonte.

“He often put up his personal securities in borrowing money to run the College. This money was often borrowed from one Lane Hart of Harrisburg. In his will he left ten thousand dollars to the College Library.”

Harry Hayward, formerly an instructor in the Department of Agriculture and later Dean and Director of the Delaware College and Experiment Station, thus describes him :

“An aggressive, fighting type; a man who always had the courage of his convictions; a natural leader who always commanded the attention and respect of his associates; conservative in business; a good financier; loyal to his friends and community; an unusual type of a Christian gentleman.”

John Fields, who was an assistant in Agricultural Chemistry 1891-93 and later Director of the Oklahoma Experiment Station and still later Editor of *The Oklahoma Farmer*, writes :

“Professor John Hamilton was, if I remember correctly, Treasurer of the institution while I was there. He did no teaching, but had a lot to do with formulating the policy of the institution and keeping it going. He was a high-class, upstanding man of the Old School who rather enjoyed getting out and scrapping for something in which he had no personal interest, but which he believed to be right and for the general good. I was in touch with him also while he

was connected with the United States Department of Agriculture as Director of Farmers' Institutes. He had considerable influence in shaping the trend of agricultural extension work as it later developed."

As remembered by Dr. A. C. True, Director of the Officers of the Experiment Station of the U. S. Department of Agriculture, who knew Professor Hamilton as Treasurer of the College and was quite intimately associated with him as Farmers' Institute Director:

"Professor Hamilton was an intelligent, conscientious and loyal man in his relations with his country, state, college, church, and associates. He had a profound interest in the farming people and worked earnestly to promote their best interests. He had high ideals regarding what might be done to advance agriculture and country life and these sometimes led him to disregard practical limitations in his efforts to secure the best results."

Dr. Charles A. Browne, Director of the Bureau of Chemistry of the U. S. Department of Agriculture who had been an instructor in Chemistry at the College for a number of years, says in a letter to the author:

"I was introduced to Professor Hamilton by Dr. G. G. Pond early in 1895, the formality taking place over the counter of the Treasurer's office in the Old Main Building. The picture which I formed of him then is the one which has always remained with me—that of a kind-faced dominie of the Old School, always neat and perfectly groomed, very methodical in

his actions and with a mildly decisive way of conducting business. I saw Professor Hamilton occasionally in Washington when he was in charge of the Farmers' Institute work of the U. S. Department of Agriculture and I used to call upon him at his office whenever opportunity presented. He was interested in the account which I gave him of my Farmers' Institute experiences in Louisiana, as the correlation of all the local agricultural problems in the different states and sections of the country was a subject to which he was giving much attention.

"Professor Hamilton was an excellent speaker; among the many addresses which I have heard him deliver I recall most vividly the remarks which he made before a meeting of the Association of Official Agricultural Chemists in Washington in 1902 upon Food Standards. He created considerable merriment on this occasion by advising those of his audience who had political ambitions not to become food commissioners for it would ruin them. It was the last step, he said, that a man takes in political life if he remains honest.

"In 1909, while traveling from New York to State College, to attend the funeral of my old friend, Mr. W. C. Patterson, I met Professor Hamilton in Lewisburg at the hotel dining room where we had both gone for breakfast. He was travelling from Washington on the same errand as myself and we journeyed together the rest of the way to State College. Professor Hamilton spoke of his love for Mr. Patterson and of the great influence for good which he exercised in the

whole community. I had a good opportunity during this trip to learn something of Professor Hamilton's great devotion to State College. The past, present, and future of the College seemed to be the controlling thought of his life. The occasion of Mr. Patterson's funeral was, I believe, the last time I saw Professor Hamilton. The impression I formed of him then was that he represented one of the last connecting links between the old college when it was just a Farmers' High School and the new College with its beautiful buildings and enlarged equipment. He seemed always to me a fine representative of that old-fashioned, sterling integrity which characterized a generation that has now passed away."

Dr. Harry J. Patterson, Director of the Maryland Experiment Station and later President of the Maryland Agricultural College, is a son of Mr. W. C. Patterson mentioned above. He thus states his recollections of the subject of this sketch:

"Professor John Hamilton was an outstanding man and exerted some influence upon my life as far back as I can remember. My first recollection of Professor Hamilton was when I was about four years old and he was conducting classes on the farm when the present campus directly in front of "Old Main" was under cultivation.

"At that time commencement came in the winter season, and the long vacation was during the winter season when the students could be set free to teach school. It was a custom at that time during certain nights in commencement week to illuminate Old Main

by placing a row of tallow candles in each window. Professor Hamilton as Professor of Agriculture, and my father as Superintendent of the Farms, were very closely associated in their work. Consequently, I had an opportunity to see and observe Professor Hamilton very frequently. Professor Hamilton was my first Professor of Agriculture. I was also associated with him by assisting in bookkeeping in the Business Office when he was the College Treasurer and Business Manager.

“The thing which I think was outstanding in Professor Hamilton all through his life was his desire to have things conducted on a practical and economical basis. I saw much of him when he was Secretary of Agriculture of Pennsylvania. His outstanding work in both of these capacities was to carry information to the farmer which would help him to conduct his operations on a real practical business basis and to raise the standards for the farm and the farm home. While we did not recognize rural and farm economics and sociology under that title in his day, yet in reality he was one of the earliest and leading men in those subjects. While he was in Washington and after he retired to his home in State College, I always embraced every opportunity to call on him, and never missed getting a new point of view on some agricultural matter. To me Professor Hamilton was much like a storage battery and you never could touch him unless you got a bright spark of information. My association with Professor Hamilton has been very valuable to me, and served many a splendid purpose all through life.”

Professor I. Thornton Osmond, who was Professor of Physics from 1879 to 1907 and who was Professor Hamilton's nearest neighbor for several years in State College, says:

"I count it one of the good fortunes of my life that I had a long acquaintance with Professor John Hamilton. Such was his integrity and uprightness that association with him was an elevating influence in life."

The following closing paragraphs from an address on the Early History of Center County which Professor Hamilton delivered before the Bellefonte Chapter of the Daughters of the American Revolution, November, 1919, probably presents his philosophy as he would have it expressed.

"But I am reminded that we are not considering the lives of men so much as the completion of six score years in the life of a political division of the nation. All who were living at the birth of this county are now dead. This period extends beyond the life of most men and we have no one here to tell us from personal knowledge of the events that took place when this county was set off and began its existence as a unit in the government of the State. Perhaps this is just as well for we have to do with the things of today, and tomorrow, and the coming century, rather than with the past. Our vision, therefore, instead of looking back over the past, ought to take position on the mountain top of present achievement, and from this point of vantage, look forward into the future. If the progress of this county during the

past 120 years has been so wonderful, with comparatively sparse population and but few workers to conduct her affairs, what ought we to expect of the coming century, 100 years from now, when the population shall have increased to several hundred thousand, or 1,000 years from now when the inhabitants shall reach into the millions, all highly educated in the arts and sciences of that period, with powers multiplied through mechanical and scientific discovery, until each individual is several times as effective as in our day?

“For six thousand years, this area, which we call Center County, has been preparing for our use, and if geologists are to be believed, millions of years more preceded this historical period of man’s existence in the world. Does any one suppose, that after all of these ages of preparation for our occupation, Center County is to be thrown away in one or two centuries as a worn out, exhausted and useless old garment? Does it not rather indicate, that for hundreds, yes thousands of years to come, this county is to exist, and be peopled and serve its purpose in blessing man, and in performing its part in the great civilization, upon the development of which we have only just begun?

“We are in danger of measuring the existence of the State by our own short lives, and shaping our plans for its welfare by attending only to its temporary needs, and the wants of ourselves and others for today, forgetting the great mass of humanity yet to come, who will depend upon our actions and wisdom

for existence, happiness and power, as we have depended upon those who preceded us. If we today are reaping the rewards of the toil, forethought and sacrifices of men and women long since dead, and if we are living in the enjoyment of life, liberty and knowledge, because of the accumulations which the centuries that are past have stored up for us, will not future generations be equally dependent upon us for the blessings that they are to receive? The wisdom, care and selfishness with which we plan will, unquestionably, affect for good or ill the future prosperity and continuance of the State. The past is beyond our reach. It is with the future that we have to do. What is our duty?

“A great social reformer years ago declared, that he endeavored to ‘forget the things that were behind and that he pressed forward to the things that are before.’ Because he and others like him did this eighteen centuries ago, we today enjoy what we have of civilization and liberty and religious light. We are become debtors to the ages that are gone, not only for the treasures stored up in mine and forest and field but for teachers in morals, in science, in medicine and law as well. We are debtors to all men and to all things.

“What ought we to do, what can we do, for the generations still to come, that will cause the citizens of this county in the succeeding centuries to bless us? Grateful to the past, and anxious to show your gratitude, what can you do for the future? You can plant a tree. You can dig a well, build a house, edu-

cate a boy, train a child, build a road, bridge a stream, speak a word, sing a song, save a soul.

“We can be true men and true women ourselves, courageous, truthful, honest, pure, charitable, and patient. We can be cheerful, patriotic, God-fearing men and women, building characters that shall never perish, but be transmitted from generation to generation as long as human beings live upon the earth and extending over into the eternal existence that lies beyond. We can do the duties of today in such a way as to project their influence through tomorrow and cause the thing we start to continue forever. We can vitalize work—plain, commonplace, everyday work—until it will finally take on the glory and garb of immortality. We do this, not by performing it selfishly for ourselves, but for others, that we may bless mankind and leave the world in which we live better than we found it. This is the inspiration that must enable your life and mine if we are ever to be considered worthy, when the centuries have run their course, and all men stand to be judged for the deeds that they have done. When what you have done, and what I have done shall be estimated, not by the approval of mankind, but by its effect in advancing the eternal principles of righteousness and truth as we came in contact with them in our journey through the world.

“Friends, we stand today upon the shores of a new century looking forward with expectation to the coming of a new era in political, religious and social reforms. It becomes us, therefore, in view of our responsibility for the coming in of that glorious day,

to gird ourselves anew for redoubled effort and emulate the heroic deeds and lives of our self-sacrificing, unselfish ancestors, by giving such an impulse to all that is valuable in our time as shall carry the blessings we possess to a thousand generations yet to come."

VII

WHITMAN HOWARD JORDAN

October 27, 1851

WHEN Professor John Hamilton relinquished the work in agriculture, he emphasized strongly, in a letter to the President and Trustees, the importance of getting a man with a broad scientific training for the position. At that time the rôle of chemistry was receiving more consideration than any other subject in or connected with agriculture.

Outstanding men in agricultural science were scarce at that time. The College was unable to obtain one whose reputation had been made and who would bring his reputation with him to the College. The next best thing was to obtain the services of a well trained, active, and promising young man; one of stability and ambition, whose growth might carry the development of the College with him. After carefully looking over the field the choice fell upon a young man then employed as an instructor in the University of Maine.

Whitman Howard Jordan, the son of a farmer, was born at Raymond, Maine, October 27, 1851. His parents were James and Sara (Symonds) Jordan. His preparatory education was received in the public schools, including what was then known as the



WHITMAN HOWARD JORDAN

ALLEGHENY COLLEGE LIBRARY

Free High Schools, at a private school, and at Nichols' Latin School.

He was graduated from the University of Maine in 1875. He took graduate work there for a few months and then went to Cornell for a year and a half. From Cornell he went to the Connecticut Experiment Station at Middletown where he carried on investigations on the composition of food fish which had been put in charge of Dr. Atwater, the Director, by the United States Fish Commission. He assisted Dr. Atwater in closing up the work of the Connecticut Experiment Station before its removal to New Haven; after this period he returned to his Alma Mater as an instructor. He received the Master's degree from the University of Maine, in 1879. In 1880 he was married to Miss Emma L. Wilson.

Young Jordan was elected Professor of Agricultural Chemistry at The Pennsylvania State College and served from January 1, 1881, to July 1, 1885; at the latter date he was recalled to the University of Maine to serve as Director of the Agricultural Experiment Station, and was succeeded in Pennsylvania by William Frear. He held the Directorship in Maine until 1896, when he was elected Director of the New York State Experiment Station at Geneva, which position he held until his retirement in 1921. He was also Professor of Animal Nutrition in the New York College of Agriculture at Cornell University, 1920-1921.

Although Dr. Jordan served a comparatively short time at The Pennsylvania State College, it was suffi-

cient for him to institute a work which remains one of the most highly considered and important projects of the Agricultural Experiment Station, the importance of which will doubtless increase with the years.

From the beginning of the Farmers' High School, plot experiments and tests were conducted by Professor Waring even before the school opened, in spite of the handicap that there were no scales for accurate weighing. The work of Professor Waring was somewhat elaborated and continued by the first President, Dr. Evan Pugh. Dr. Pugh was, however, a laboratory chemist rather than a field experimenter. Very little was done during the administrations of Presidents Allen and Fraser.

In 1868, Dr. Thomas H. Burrowes, when he became president, planned and laid out an elaborate system of plot experiments on all three of the Experimental farms, Eastern, Western, and Central. This work was conducted by Professor Hamilton after his appointment as Professor of Agriculture in 1871, but no permanent comprehensive plans seem to have been devised. The plot work was largely temporary and while of great value, especially for demonstration purposes, it had been subject to so many changes due to pressure from various sources that a definite plan had not yet been established.

One of the first things Dr. Jordan did was to lay out a set of permanent soil fertility plots and secure the adoption of a plan as a basis for future work. The 144 plots known as the Old Fertilizer Plots were the result of this plan. They have been continued

down to the present time, 1926, under the same four-year rotation and practically the same fertilizer treatments as started by Dr. Jordan.

Before Dr. Jordan's plan was adopted and put into execution no attempt had been made to continue the same treatment on the various plots year after year. A plot that had nitrogen one year might have phosphoric acid the next, and might have complete fertilizers the year after. Thus the residual effect of fertilizers applied in previous years often tended to vitiate the results. It was with some difficulty, therefore, that a sufficiently uniform and otherwise suitable piece of land could be secured on the experimental farm.

In Bulletin No. 1 of the Experiment Station, dated October, 1887, Dr. William Frear in writing of Dr. Jordan and his connection with the field experiments declared:

"His relation to the experimental work was the same as that of his predecessor, but he was relieved of numerous other duties that had devolved upon Professor Hamilton and was thus enabled to devote more time to research.

"In consequence of this change, a more careful checking of field experiments was rendered possible, and laboratory research became an important element in the experimental work conducted by Professor Jordan during his period of instruction, from 1881-1885.

"Among the other changes, Professor Jordan introduced a new programme of field experiments, designed to show the effects of various fertilizers upon

the crops of the usual four-year rotation.....This new programme was put into operation upon four tiers of plots of one-eighth acre area, thirty-six in each tier."

Although Dr. Jordan's greatest reputation came as Director of the New York Experiment Station at Geneva, and the work done as Director of the Maine Experiment Station which was highly constructive, he will be remembered in Pennsylvania agriculture as the "Father of the Old Fertilizer Plots," the oldest continuous fertilizer experiments in America. It is very doubtful whether he realized at the time the importance and the far reaching influence of the work he was doing.

He, himself, says of his work at The Pennsylvania State College:

"I began my work at Penn State on January 1, 1881. The conditions there were crude in comparison with what many other Land Grant institutions were doing.

"There were no vocational courses worth speaking of. A very little was done in the way of agricultural instruction, but nothing with the mechanic arts. Practically all the opportunity offered along these lines was by the way of electives. The main instruction was along the lines followed by classical colleges.

"It is true that I organized the fertilizer plots, but I do not regard this as the most important service I rendered the College.

"Professor Osmond, Professor of Physics, was a graduate student at Cornell at the same time I was.

One evening while he and his wife were calling on us in the big stone building, we raised the question as to why the College did not have segregate vocational courses. We then looked over some catalogs and after discussing the matter for some time decided to ask certain members of the faculty to attend a conference. At this conference the duty of arranging courses in agriculture, engineering, and general science was assigned to members of the faculty. Such courses were arranged and given general approval, and a decision was reached to ask the Board of Trustees to come together to consider their establishment.

“General Beaver had asked me to go with him to Harrisburg to meet the Trustees and certain members of the Legislature, and I was delegated by the faculty (a part of it) to request the Trustees to meet at the College by committee or otherwise to consider our propositions. Our request was granted, the committee met and occupied two days (?) going over our suggestions. This was followed by a meeting of the full Board and the proposed courses were formally established. At the same meeting President Shortledge was relieved of his duties.

“I regarded my small part in this general result as more important to the general welfare of the institution than the plot work.”

Professor I. Thornton Osmond, mentioned above, in a letter to the writer, says concerning the reorganization of the instruction in 1880-81:

“In the catalog of 1879-80 there are three Courses of Study. Two, Classical and Scientific, just like the

courses at that time in any of the 25 or 30 colleges of the State. The third, Agricultural, differed not so much from the Scientific. I went there in '79 determined to do all possible to change the organization and character of the College. I found C. Alfred Smith, '62, Professor of Chemistry, quite ready to help, and sent a sketch outlining the reorganization to Cyrus Gordon, '62, an Alumni Trustee whom Professor Smith visited in Christmas vacation of '80. Professor S. reported that Gordon very fully approved the general plan. Then I approached Professor Buckhout on the subject and found him favorable but inclined to think it useless to try. We three talked it over and came to where it involved the question of retaining the Greek, Professor McKees' work. All three of us wanted to keep it if we could. I told Professor McKee the situation; he approved our plan, and said to go on even if it be necessary to leave out the Greek, and from that time on he was with us—as I knew he would be—and filled out the agricultural part of our scheme. So we had on paper a completely changed college. But we were just five men without authority from the Trustees or even appointment by the faculty.

“In April, '81, President Shortledge had a called meeting of the Trustees at the College, and after they had relieved him of his duties with leave of immediate departure, Trustee Gordon came and asked me how far the plan of reorganization was worked out. I told him it was completed, and he said he would present it to the Board. They approved it, and ap-

pointed Professor McKee (just made Acting-President), Professor Jordan and myself a committee to attend to having it printed and distributed that summer, to go into effect in the fall of 1881. The Pennsylvania State College began working along its proper lines of work in the fall of 1881."

He says further concerning Professor Jordan and his work here:

"In the College year 1877-78, as a graduate student in Cornell University, I became acquainted with W. H. Jordan, another graduate student, from Orono, Maine. So high was my estimate of his personal character and ability that when Professor Hamilton resigned in 1880, I immediately proposed his election as Professor of Agriculture. He was then instructor in the Maine State College, and it took considerable persuasion to get his consent to change. But here he could build on his own ideas as the foundation of an independent career, without waiting uncertain years for such an opportunity, and he came, he built, and his work remains."

Dr. Jordan started the publication of Agricultural Bulletins at The Pennsylvania State College. All but one of the first fifteen bulletins were written by him. This work was continued by Dr. Frear until the Experiment Station was organized, and the publication of a new series of bulletins was begun.

In 1884 Dr. Jordan was appointed Chemist to the State Board of Agriculture, and in that capacity made the analyses necessary in the fertilizer control maintained by that Board.

“*The Feeding of Farm Animals*” and “*The Principles of Human Nutrition*” are two standard works written by him. In recognition of his attainment and his contribution to agricultural science, his Alma Mater conferred upon him in 1896 the honorary Doctorate of Science.

While Dr. Jordan left a marked impression upon The Pennsylvania State College and the Experiment Station, and did much for the Maine Station, it was really in New York that his greatest work was done. He is generally regarded as the first real scientist connected with The Pennsylvania State College after Dr. Pugh. Other men were great teachers and leaders, but Dr. Jordan was also a scientist. He is remembered in State College as a good fellow, liked by everybody, and well acquainted in the community.



WILLIAM CALVIN PATTERSON

ALLIANCE OF GOLD MINERS

VIII

WILLIAM CALVIN PATTERSON

January 31, 1838

October 2, 1909

AMONG the makers of the School of Agriculture and Experiment Station of The Pennsylvania State College there was one whose work and influence perhaps more than that of anyone else contributed to its stability and equilibrium. While storms often threatened and sometimes broke about the College, his feet were always on the ground. His clear mind and steadfast refusal to be stampeded were often the inspiration of his less courageous associates. His reputation and success were many times a strong factor in holding the confidence of the public in the College.

William Calvin Patterson was one of the sixteen children—nine sons and seven daughters—of John Harris and Mary (Irvine) Patterson. He was born January 31, 1838, on the Tussey farm near Graysville, in the northern part of Huntingdon County about thirteen miles from the scene of his life's work. His father was a building contractor and millwright. He built the Pennsylvania Furnace and many of the old mills in Center, Huntingdon, and Blair Counties.

"Cal," as the subject of this sketch was known to the family and neighbors, farmed until the beginning

of the Civil War. On May 28, 1861, he was married to Miss Adaline Mattern of Warriors Mark, and the following day, May 29, he enlisted at Huntingdon Furnace in Company I (eye), 5th Regiment, Pennsylvania Volunteers. He participated in, under fire, the battles of New Creek, Drainesville, Mechanicsville, Gaines Mill, Charles City Cross Roads, Malvern Hill, Second Bull Run (two days) Shantilla, South Mountain, Antietam (two days), Fredericksburg, Gettysburg, Mine Run, Bristoe Station, and was twenty-five days under fire in The Wilderness. Taken prisoner, he spent a few weeks in Libby Prison, Richmond, Virginia, where he was on Christmas Day, 1862. From there he was transferred to Camp Parole, near Annapolis, Maryland. He was released just in time to reach Gettysburg and take part in that battle.

He related to the writer an incident of his trip from Camp Parole to Gettysburg. He and another prisoner made the trip on foot and, as it was summer and the weather very warm, they frequently stopped at roadhouses for refreshments. His companion partook of enough to make him very cheerful and happy. When they came within hearing of the cannon, his companion said, "Well, Cal, if we get killed up here, we've had a bully good time coming up, haven't we?"

During January, 1862, Patterson was in the hospital with fever for several weeks. Appointed sergeant in 1862 at Sharpsburg, Maryland, he served in that capacity until discharged. He was ranking officer in his company at the time of his discharge as all the other officers were either dead or had been trans-

ferred. Commanding the company during its last engagements, his appointment as captain was in process at the time of his discharge, June 15, 1864.

After the war he engaged in farming near Yellow Springs, Blair County, on a rented farm. He gave this up to go into partnership with his brother-in-law in a general merchandise store at State College. As confinement of inside work in a store did not agree with him, he sold the store business and purchased a farm near Etna Furnace, in Huntingdon County. While engaged in conducting the store he had become acquainted with Professor John Hamilton. He assisted Professor Hamilton in the management of the College farm for a few weeks after selling the store and before moving to his own farm. This activity resulted in an offer to return to State College as Farm Superintendent, which was accepted in 1871.

The first charter of the College granted in 1854 required "The boys shall, themselves, at such proper times and seasons as shall be prescribed by the Board of Trustees perform all the labor necessary in the cultivation of the farm." This provision was also incorporated in the second charter which was granted in 1855 and under which the College operated, and was in force until amended by the Court of Center County, November 22, 1875. Thus, labor was not only a part of the curriculum established by the College, but was required by the Statute of the Commonwealth. Most of the agricultural colleges in their early years required farm labor of all students.

Mr. Patterson progressed unusually well with the students and was always popular with them. They often went to him for advice; he liked to be consulted by them and took a kindly paternal interest in them. This friendliness was especially notable since his first contact with the students was as Superintendent of Student Labor. Many a discouraged student was persuaded to remain in College through his friendly counsel, advice, and assistance.

His success as Manager of the College Farm and Superintendent of Student Labor caused Professor John Hamilton, then Professor of Agriculture and Business Manager of the College, to recommend his appointment in 1881, as Superintendent of the Central Model and Experimental Farm, afterward known as the Experiment Station Farm, and later as Farm No. 2. In these capacities he served until his death. He was not only superintendent of the farms, but later was put in charge of all the buildings and the campus as well. He employed all the janitors and other labor connected with the College for many years.

He not only handled the student labor well, but was equally successful as manager of common labor. It is said that he was always in action. Laborers never knew when or where he was going to appear. He tried to treat his men fairly and expected as much of them. At one time a strike was organized and the leaders of the strike were some of his most trusted workmen. Most of the strikers returned but several of the leaders never were reinstated.

Patterson's ability as a harmonizer and counsellor was exceedingly valuable to the College authorities on many occasions. His judgment was probably deferred to by President Atherton more than that of any other man. He was also a great friend of Professor Hamilton. Undoubtedly the army experience of these three men and General Beaver, President of the Board of Trustees, formed a community of interest which contributed to the harmony with which they worked. Not that they always agreed, but each recognized the ability and talents of the others and all were united in making the interests of the College paramount. Mr. Patterson had never attended college himself, yet in the wider field of the college administration and policy his counsel was often sought by his colleagues.

Probably no characteristic of the last three decades of the nineteenth century stands out more prominently than the control of public affairs most exclusively by men who had seen service in the Civil War. They had learned to work together, they had a wide acquaintanceship and the benefit of a number of able, active, aggressive leaders. Their influence was so great and so well-known that the man would be foolhardy indeed who would dare to oppose them, and the first care of all politicians during that period was the soldier vote.

Mr. Patterson was much attached to his comrades of the Civil War and always enjoyed talking over and comparing experiences with them. He was a loyal member of the Grand Army of the Republic, and in

his attachment to his comrades and to the cause for which they fought very few surpassed him. He told the writer that one time he was standing on the platform at Tyrone waiting for a train when a comrade came up who was going to take the same train. So interested did they become in the conversation that the train arrived and left without either of them having seen it.

He was a Democrat in politics and probably the best known man in Center County at the time when a Democratic nomination was equivalent to an election. On more than one occasion Mr. Patterson was asked to permit the use of his name as a candidate for the Legislature. He always declined on the ground that he did not believe it would be best for the interests of the College to have the county represented by one who was directly connected with it.

Although reared a "blue stocking" Presbyterian of the strictest type, he and his family were members of the Methodist Church in State College. He was decidedly its most influential member and most generous supporter. In his transfer from one denomination to the other he lost nothing of his strict orthodoxy of either belief or practice.

He was usually generous in granting the services of the farm hands and the use of the teams for any general college or student activity; but on one occasion, when "Parker's Boat" stalled at the "Y" of the Bellefonte Central Railroad with a party of girls coming in for a "Prom," he was asked to send teams to bring them in. He replied that for anything but a

dance he would do it, but he "would not ask the men to go out at night to bring girls for a dance."

Soon after Mr. Patterson took over the Central Experimental Farm he began the delivery of milk at five cents a quart and quickly developed a demand for all he cared to produce. He also introduced the fattening of steers for market to utilize the coarse feed produced on the farms and convert the straw into manure to be used in building up the fertility of the land. Through the use of student labor he cleared the fields of stones which were used in building roads on the farms and from the College to the turnpike. The farms were made to improve themselves and at the same time to form a source of revenue which contributed to the support of the College and Experiment Station.

In 1907 a field of eight acres on the Experiment Station Farm produced five and a fourth tons of hay to the acre while a field across the fence on a neighbor's farm produced less than half a ton to the acre. The two fields 27 years before had been of approximately the same fertility and had been farmed for the most part in the same kind of crop rotation. Although this neighbor was not a conspicuously poor farmer, the two fields were in corn two years later and the difference in yield was about the same. This productivity is typical of the high state of fertility to which the College farms had been brought. The College farms consistently showed a greater annual profit than most of those in the vicinity.

As a business man Mr. Patterson frequently nego-

tiated loans for the College and often lent his personal security along with that of Professor Hamilton, the Treasurer and Business Manager. In the small loans which were negotiated locally, he was probably more influential than Professor Hamilton.

Mr. Patterson's executive and business ability was universally recognized. He was frequently offered positions at more attractive salaries away from the College, but he chose to remain. He was recognized as a judge of livestock by the stockman of the state and his services were often in demand in that capacity at county fairs. On the Pittsburgh livestock market, where he sometimes dealt, he had the confidence of the commission men and the buyers.

He was a director of the First National Bank of Bellefonte and, when the First National Bank of State College was established, he became president and held that position until his death.

In order to relieve the housing condition in the village, he and a number of other citizens organized in the nineties, a building and loan association of which he was made president. The community proved too small to support the association and after a few years it was disbanded.

In "An Appreciation" published anonymously in the *Penn State Farmer* for November, 1909, the author, who had known him intimately for almost twenty years, says: "Here was a man who had never known the meaning of a higher education, and yet the practical contacts of daily life had given him a rich equipment of the very things most needed in the manage-

ment and advisement of a great growing college. He who had had no formal education became the closest friend and adviser of men who were graduates of our oldest colleges or universities. He did not go to them for counsel. They were only too glad to go to him. Interests here became yearly more and more complex. Men who moved alongside of him died under the growing strain of pressure, and, no doubt, his own life has been shortened by that strain. But never did he lose his head, never did he fail to see clearly the practical advantages that lay along certain lines of action, never did he fail to give good counsel or to stand firm and true in times of crisis.

“Yes, Mr. Patterson had remarkable gifts, but so has many another man who has made but a sluggard’s use of them. Mr. Patterson was tall and finely proportioned. He had a kindly eye and genial smile. He knew how to approach men. He had unconscious genius and skill in reading and understanding men.

“Furthermore, his habit of greeting men and keeping in close touch with them made him a skillful and wise counsellor in many matters. He, somehow or other, gathered up the reins of a vast amount of practical knowledge of men and things, until he became a vast treasure-house of information and could always put his hands on the occasion and the man when necessary.”

Dr. W. A. Buckhout, who joined the faculty of the College the same year Mr. Patterson took over the College Farm, thus writes of him in the 1911 *La Vie*:

“Probably the most conspicuous points in his character were the transparency of his life and the dignified way with which he dealt with the duties of the daily round. These traits were not acquired in later life, nor assumed for effect. They were inherent, and marked his service as an overseer of a small force of farm laborers no less than in the multifarious and more responsible duties of his later years. They were the product of a rich inheritance, coupled with the ability to choose out of the experience of life that which makes for clearer thinking and higher living.

“Intercourse with him was always a pleasure. He never seemed to flatter or curry favor, nor presume to obtrude, even when he could claim some special consideration.

“The influence of such a man is beyond estimate. It exercised a constant restraint and lifted up the tone of all with whom he had to do. It was an inspiring example, particularly to young people, before whom is so commonly and unnecessarily placed the idea that life is a struggle for mastery; that naught avails save that which reaches the top by crowding aside all lesser and weaker rivals. His ambition extended no further than to be true and faithful to the duties and opportunities of a humble life. He had no desire to shine brighter than nor rise higher than others. His life was a living proof of the poet's, ‘Honor and shame from no condition rise; act well your part, there all the honor lies.’ ”

Hon. Thomas W. Barlow, a trustee of the College and a member of the class of 1877, said in an address

at the memorial service held for Mr. Patterson, and printed in the *Penn State Farmer* of January, 1910:

“I was nineteen years of age when I first met him. He was at that time the Farmer of the College; and from the first moment of that early acquaintance to the day I last looked upon his dear honest face, there continued a friendship between us unbroken by a single discordant note and which marked our occasional interviews, sometimes years apart, with delightful and inspiring conversation. He was always glad to see me and it made me happy to see him.

“In my time his duties brought him in closer touch with the students than those which belonged to his office of later years. He had much to do with the work of improving the appearance of the campus and in the general development of the Agricultural Department. In these labors he exhibited unusual powers of administration and a strong good sense, combined with a kindly spirit, which aroused the interest and friendship of the students and the appreciation and perfect trust of the institutional officers. I remember many happy days on the farm in his company and I received from him much practical instruction which was useful to me in after life.

“He had a beautiful life—lived here among these green mountains and fertile valleys, these grassy lawns and shaded walks, amid peaceful scenes of pasture and meadow—contented to remain close to the Earth, which is the very renewal of life, with his feet firmly planted upon the soil.

“In his chosen home he was blessed with the asso-

ciation of men of culture, learning and refinement. Himself not learned in the knowledge of books, he had a happy appreciation of his daily contact with educated men and educational endeavor.

“To live in an atmosphere distinctly above and beyond the reach of sordid desire—to refuse to aspire to that vague success that we Americans love to glorify—to decline to submit, in the rush and fever of pursuit, to a life that smacks of the slavery of the spirit, that is so much worse than any mere slavery of the body; to become a part of a great force that works for the uplifting of the race, to be content with a small reward in money for a higher recompense found in serving others, so that ignorance may yield to the love of knowledge—that is real living.

“To live with buoyant youth with all its illusions, aspirations and dreams—youth, large, lusty and loving—full of force, grace and fascination, ever pressing on with a high spirit and dauntless courage to win the goal—that is real living.

“In this fertile soil he thrived, developing with the growth about him—measuring up to ever increasing responsibilities. He was a part of the institution. It was his home. He was its loyal, devoted ally. Presidents, deans, professors, teachers and workers came and departed, but our friend remained. He was a member of the Old Guard.

“He gloried in the progress that was ever before him. All things were growing better—striking higher levels, ascending into larger, more important and more useful activities. We can make no higher tribute to

him than these words. In all this splendid history he did his part and did it well.

“He lived a beautiful life—as much above the sordid, smothered, strangled, starved and crowded haunts of men, as the top of yonder hill is above the Ghetto of the city.

“He possessed the unusual attribute of making many friends easily and holding them to him. In all my life I never heard a State man speak of him, except in terms of admiration and respect and with smiling reference to his genial, attractive and robust personality.

“Happy and fortunate was he to live to see our College marching with assurance to a consummation of his dearest hopes. That he was a part of State, and of its governing force, was his greatest pride and he wore it like a red rose upon his heart.”

In the “Memorabilia of Old State College Members of the School of Agriculture” furnished to the author, Dr. C. A. Browne, Chief of the Bureau of Chemistry of the U. S. Department of Agriculture, pays one of the highest tributes to Mr. Patterson.

“The man of all my old acquaintances at State College who expressed most perfectly in his character and manner that proverbial trait called ‘milk of human kindness’ was W. C. Patterson. I knew him intimately during all the period of my residence at State College. He seemed to me always the same kind, benevolent old gentleman, well poised in every kind of situation and with a wonderful endowment of the practical wisdom, known as common sense. He

was the confidant, friend and adviser of everyone in the community from the President of the College down. People went to him so naturally with their difficulties that he performed a service something like that of a 'father confessor.' He did not wait to be sought after but if he learned of trouble in any family or household, he went there immediately to proffer his aid. He was not only constant in lending his voice to good cheer and encouragement but when the occasion demanded he was ready to sound words of reproof and reprimand, and this he did with equal freedom among those of high or low station. He was especially solicitous about the welfare of the younger people of his acquaintance and his fatherly advice was helpful to many a young man at the critical moment.

"Mr. Patterson's house was almost like a home to me, as it was to many of the residents of State College, and I have pleasant recollections, almost numberless, of happy hours passed in his company. I roomed for several years in the old Experiment Station building and it was only a few steps from there to Mr. Patterson's house. The young folks used to congregate there evenings for games, parties and other social happenings. The playing of charades and the telling of stories were favorite pastimes.

"A very amusing incident took place during my residence in the old Station Building at which Mr. Patterson used to joke with me frequently. There had been numerous robberies in the Station Creamery and I had been requested by Mr. Patterson to keep

a look-out from my room in the station tower in case I heard any unusual noises at night. Late one evening, after retiring, I was aroused by the voice of Enos Hess,* who roomed below me, telling me that robbers had broken into the creamery. I dressed hurriedly and taking my revolver rushed over to the creamery with Enos. Surely enough, I could hear someone moving about inside the building. Telling Enos to get Mr. Patterson, I stationed myself at the door of the creamery and whenever the person inside made a suspicious noise I would silence him by discharging my revolver into the air. Very soon Enos returned with Mr. Patterson who informed me that the person I was holding prisoner inside the creamery was not a robber but a detective he had engaged to watch the place, a private tip having been received that a robbery was to be attempted on that or the following night.

“Mr. Patterson was always very jealous of the good name of the College and the misdoings of unruly students gave him considerable anxiety owing to his fear of unfavorable publicity. I remember particularly an occasion of this kind when some students, one Saturday night, suspended across the street at Grieb’s Hotel several white banners on which were printed some very derogatory and obscene remarks about various members of the faculty. Mr. Patterson had the flags removed as soon as he learned of their

* Enos H. Hess, a member of the class of 1900, assistant in agriculture at the time, later a minister of the Church of the Brethren, and at present (1926), Principal of the Messiah Bible College and Missionary Training Home at Grantham, Pa.

presence which was not, however, until they had been seen by many students and residents of the town. One student who was anxious to have a souvenir of the event, took some photographs of the banners. When Mr. Patterson learned of this he insisted that the undeveloped plates be destroyed immediately as he feared the distribution of such photographs, especially if they should get to a newspaper reporter, would do a vast harm to the College.

“I have already referred in my reminiscences of Professor Hamilton to my trip from New York to State College at the time of Mr. Patterson’s death. The large number from far and near who came to attend his funeral impressed everyone alike with the extent of the influence which Mr. Patterson exercised in the affairs of the College and of the college community. The most pathetic tribute to Mr. Patterson’s memory which I heard on that occasion was a remark of old Henry Shreffler, a fellow veteran who had marched with Mr. Patterson in many a Memorial Day parade. Old Henry was too ill to attend the funeral and when I called upon him he remarked tearfully that his old friend and benefactor having now passed away, life to him was so empty that he had nothing more to live for.

“If a complete account could be obtained of the diverse personal influences which have been exercised in the past for the welfare of State College, the record of Mr. Patterson would be of a monumental character. His services were performed in such a quiet, unobtrusive way that much of the good he accom-

plished escaped notice and this was in perfect keeping with the wholesome simplicity of his character."

Harry Hayward, of the N. W. Ayers advertising agency, who was instructor in the School of Agriculture 1894-1902, says of Mr. Patterson:

"A Christian gentleman of the old school; a man of unusual ability but one who, as Dr. H. J. Waters has so well said, never accurately measured himself up with the world; a master of detail; an excellent farmer; a good financier; conservative; sympathetic and a loyal friend.

"If the intimate history of State College is ever written, the world will have a greater appreciation of the invaluable service that Mr. Patterson rendered to the institution in its early days."

Dr. W. H. Jordan writes:

"Mr. Patterson and Professor Buckhout were my most intimate Faculty friends while at the College; both were high types.

"Mr. Patterson had had little academic training, but he was a wise man. His judgment in practical affairs was implicitly trusted. He was known at the college and in all the country round about as a man of high ideals and unquestioned integrity. I think it could be shown that his reputation, his credit, if you please, warded off financial disaster to the College. He was kind and thoughtful. He devoted himself untiringly to the affairs of this institution."

Professor I. Thornton Osmond pays this tribute:

"Mr. Patterson's personal qualities won for him the deserved esteem of every one connected with the

College. His experiences in Agriculture and business, his excellent judgment, and conscientious performance of his varied duties, were of the highest value to the College."

John Fields, of Oklahoma, a member of the class of 1891, says:

"The biggest man beyond any question, and without disparaging any of the others with whom I came in contact, was W. C. Patterson, whose official title was Superintendent of the Farm. He was the Father Confessor of the entire outfit, especially with reference to financial matters, and more nearly than any other person carried the burden of the entire institution. He was a strong man and a capable executive—tireless in his efforts to get things done for the College at the lowest cost. I was intimately acquainted with him and his family, and know that during the period that I was there all others who knew him regarded him as I did."

George C. Watson, who was Professor of Agriculture from 1894 to 1907, writes:

"When I first met William C. Patterson he was well past the prime of life, but vigorous in mind and body as nature had so made and moulded him. He was untiring in his efforts to improve and make better in various ways the things and people with whom he associated.

"He was never a radical reformer of a less fortunate class, but by giving kindly words of advice and encouragement, sometimes of disapproval, he was a power for improvement and better living in the

community in which he lived. His path of right living was clearcut in his own mind and from which no power could make him depart. He was unassuming, yet if it seemed necessary or best to do so he never hesitated to take great responsibility which he faithfully discharged. He was a hard worker, honest, true to a trust, upright, conscientious and measured other men of his class by the same standards he set for himself.

“A most loyal American who had great respect for the laws of Nation, State and local authorities. A kind heart, a smiling countenance and his fondness for children caused him to be frequently dubbed ‘The grand old man,’ a title that he richly deserved.”

For almost thirty-nine years William C. Patterson was the big man of the College. A large man physically, of erect bearing, in mentality and character he measured up to his physique; he had an inspiring personality. As a farmer, as a business man, as a counsellor, as a friend, during his period of service he was the dominant personality of the College and the community.

IX

WILLIAM GRIFFITH WARING

October 30, 1816

May 18, 1906

THE following sketch of Professor Waring was prepared for the most part by his grandson, J. Howard Waring, now at the University of Maine. It is printed almost verbatim as Mr. Waring presented it. A few minor additions have been made, but the plan and most of the wording are unchanged. The fact that Professor Waring did not visit the school after his resignation, and had little communication with it after President Pugh's death, makes the College records of his work very meager, and necessitates depending upon family records and recollections.

William G. Waring is frequently spoken of as having been the first President of The Pennsylvania State College. His functions and duties were similar to those of a president, in that he was the highest administrative officer. However, it may be better to use the terms of that day. One of the early reports of the Farmers' High School relates that, soon after it was chartered by the Legislature in 1855 and prior to the actual opening in 1859, it was desired by the Trustees to avail themselves of the services of one who could combine successful teaching with practical



WILLIAM GRIFFITH WARING

From a Daguerreotype in the possession of his son,
W. George Waring (about 1850).

farm operation. Such a man was found in Professor Waring. When the School opened on February 16, 1859, the faculty consisted of William G. Waring as General Superintendent of the College and Professor of Horticulture, S. Baird as Professor of Mathematics, R. C. Allison as Professor of English Literature, and J. S. Whitman as Professor of Natural Science. In the following year, with the advent of Dr. Evan Pugh as the first officer of the School to be given the title of President, Professor Waring's name appears in the records as General Superintendent of the Horticultural Department.

Fortunately, we have Professor Waring's own account of his connection with the Farmers' High School, written in his autobiographical notes in the year 1891, as follows:

“When Mr. McAllister¹ (Bellefonte) and Judge Watts² of Carlisle began to agitate for a Farm School, I assisted much by writing for different papers and helped much to get the location where it is on land offered by General Irvin. I met Judge Watts, by request, at Moses Thompson's and was offered the position of superintendent of the building operation there (1856); and when the school opened I was although I declared I had never been inside a college, injudiciously selected as Principal of the Faculty. My retiring nature and independent, unyielding ways, plain, candid, and unceremonious, soon got me into trouble with the other.....members of the faculty,

¹ Hon. H. N. McAllister, see page 179.

² Hon. Frederick Watts, see page 170.

and with boys, many of them of the worst sort, expelled from other schools. Besides this, I was at home (where even a prophet has no honor), and all the old grudges of envious or prejudiced neighbors came into play against me, and after four years of effort there—all the while supported warmly by the Trustees with brief cases of exception—and after my nerves wholly gave way at Waldie's death* (August 4, 1859) and Melinda's increasing weakness (she died 2½ years later) I resigned."

It would appear from his personal account, that Professor Waring did not serve through the year 1860, although, as previously noted, his name appears in the record of the faculty for 1860. The exact date when his resignation took effect has not been discovered.

The quotation just made from the autobiographical notes was furnished by W. George Waring of Webb City, Missouri, in a letter dated April 23, 1924. As a son of William G. Waring, and writing to a grandson of the same, he continues in his own words:

"That is all. It is enough to explain why no other reference is made throughout his memoirs to the College or to his connection with it. I know that he was very highly esteemed by Dr. Pugh, who was the first Principal, and who came while your grandfather was yet there, for Dr. Pugh made frequent visits to our home in Penns Valley after father quit the college,

* In the Waring Family Bible, in connection with the record of the death of this seven-year-old son of Professor Waring, there is the following marginal note: "This was the first death in the college building of the F. H. School." In those days the faculty and students were housed in the main college building.

and consulted father upon many things not connected with the school policies but upon matters connected with horticulture, botany, and scientific subjects. Upon one of these occasions he brought me a present of a very complete set of apparatus—flasks, test tubes, beakers, evaporating dishes and reagents—for elementary chemical experiments in analysis (I had already shown him my own crude little laboratory in the loft of our dwelling). And on another occasion he asked father to allow me to drive him to the Railroad Station (which was then Lewistown, Mifflin County) as he was called to Harrisburg. Permission was given and I (then only about 13 or 14 years old—1860) drove him from the college through the Seven Mountains. It was the most wonderful trip of my whole life, for Dr. Pugh saw in every mile of the way some interesting feature of the landscape, in the sunrise, or trees or flowering plants to discuss with me. I was never satisfied until I was enabled to become his most beloved student, and in his last illness he insisted upon my being his nurse, so long as I remained there. Johnny Miles took my place when I left.”

This second quotation is reproduced here not only as additional information concerning Professor Waring, but also for the side-light it gives as to the character of Dr. Evan Pugh. W. George Waring became subsequently an assayer and chemical engineer. His occupation led him into the lead and zinc mining states of the West, and into Mexico. It can be no small thing, therefore, for him to say of his boyhood drive through the Seven Mountains with Dr. Pugh that it was the most wonderful trip of his whole life.

William Griffith Waring was born on his father's farm at Breinton, Herefordshire, England, in the year 1816,— one of seven children of William and Helen Roberts Waring. He was employed in 1830 for three months at Abergavenny in a drug store kept by Richard George. During 1832-1833, he was tutor for several months in the Prothero family at Dinmore. In May, 1833, he emigrated to America. During the winter of 1833-34 he taught a night school at Philipsburg, Pennsylvania, composed mostly of boys employed in Hardman Phillips' screw factory. The next winter he was teacher at the "Branch," a country school about two miles east of State College. This position he secured upon the recommendation of his uncle, Samuel Waring, who had once taught in the same locality and who was well and favorably known to the school directors of the district. After two seasons there and one at the "Upper Branch School," in 1836-1837 he visited England.

After his return he taught several terms at Oak Hall. Subsequently, he went to Boalsburg and for several years taught in an academy there of which David McKinney, D.D., a Presbyterian minister, was the head. While there he was also examiner of applicants for schools of the surrounding townships—an office that was abolished later when there came to be County Superintendents of Public Schools. In 1844-45, and possibly '45 and '46, he was Principal of the Bellefonte Academy. Still later, he taught a term at Rock Hill (Linden Hall), where (October 1, 1851) he originated teachers' institutes in Centre County.

The first meeting—9 or 10 teachers—was at the Oak Hall School house. These were likewise the first teachers' institutes held in Pennsylvania. He held later larger institutes at Millheim, Howard, Milesburg, and Pine Grove Mills.

After his term at Rock Hill, Waring gave up school teaching in order to give undivided attention to the nursery which he had established along Cedar Creek, near Oak Hall, on a farm which he purchased (1839) while teaching at the Boalsburg Academy. This nursery he had stocked with hardy and superior varieties of both native and imported trees, shrubs, and plants. He early associated with himself in the nursery business his brother Robert, and in 1851 established a branch nursery at Tyrone under the immediate oversight of the brother, who moved to Tyrone.

William G. Waring was married in 1846 to Miss Melinda Coble. His connection with the Farmers' High School, as Principal or General Superintendent, from 1856 to 1860 has already been sufficiently dwelt upon. From that position he returned to his nursery near Oak Hall. A few months after the death of his wife, May 30, 1861, he removed to Tyrone which was his place of residence until his death 45 years later, in 1906. In 1867-68 he again visited England and went to the Paris Exposition. His abiding interest in the profession of teaching is shown by the fact that he served as a school director in Tyrone Borough, 1875-79, and continued to visit and take an active interest in the schools—certainly until the year 1903, his

diary for that year recording numerous references to such visits.

Born long before the time of popularized education, he attended for three years in childhood schools at Abbeydore and Hereford, but made little progress in the subjects taught because of his own frailness of constitution and defects in speech. The latter impediments disappeared later under a rigorous course of training to which he subjected himself. From youth up, he unremittingly employed the available fragments of his time in sharp, persistent study. At Abergavenny he picked up an acquaintance with Welsh. In Philipsburg, Pennsylvania, with some old books bought at a sale and some borrowed from his uncle, Samuel Waring, he studied Latin, Greek, music (flute), and surveying. Later, in the same town, with the help of two Alsatian fellow-boarders, he secured a start in French. At Oak Hall, where he boarded at one time with David Dale's family (who spoke chiefly German) attended German preaching, and married a wife of German parentage, he acquired the use of that tongue. In 1846, he learned phonography. In 1851 he wrote a book on pomology, "The Fruit Grower's Hand Book." In 1879 he invented and published a system of homographic dictée (simplified phonography). He contributed articles on agricultural, horticultural, and pomological subjects to the *New York Tribune*, *Country Gentleman*, *Rural New Yorker*, *American Agriculturist*, and other journals of his times. He edited, for many years, the Horticultural Department of the *New York Tribune*.

While living in the neighborhood of Oak Hall and Boalsburg, his services were often in demand for surveying farms. He was the only person in the region who was equipped for that work. Much of the original landscape planting about the college campus is credited to Professor Waring. "Andy" Lytle,* still living in State College Borough (1924), and Philip S. Dale, both remember when he was at the college, and recount how the present front campus was, in his day, an extensive nursery plantation. The "Old Willow," the apple orchard in which stand the present Carnegie Library, Liberal Arts, Forestry, and Watts Hall Buildings, and some of the oldest Norway Maples and other ornamentals of similar age on the campus were all planted by Professor Waring, or under his supervision. He once owned, and for a time lived on, the farm which later was sold to John Hamilton (1879) and was transferred by the latter's will to Anne T. H. Henszey, his daughter.

Bulletin No. 1 of the Experiment Station, written by Dr. William Frear in 1887, presents a historical sketch of the agricultural experiments conducted by The Pennsylvania State College, by periods, from the founding of the Farmers' High School until the establishing of the Agricultural Experiment Station. He sets forth the original plan of the Farmers' High School: that experimental agriculture should play an important part in the work of the school; that the students should, under the direction of the professors, perform the manual operations required, and that the

* A. J. Lytle died January 16, 1928.

results should be made known by information given to the numerous visitors, by lectures of the professors before various agricultural organizations of the State, and through the press.

In accordance with this plan, Dr. Frear reports, Professor William G. Waring started in 1857 certain experiments suggested very largely by local wants, and intended to determine the limitations placed upon the agricultural practices of the Farm School by the local conditions of climate and soil. His specialty being horticulture, and the intention being to establish a large nursery business in connection with the school to furnish a part of an income to pay for running expenses, a large share of these experiments were made with reference to the needs of the horticultural department. A number of experiments were made in general cultivation, fertilization, and testing of varieties of agricultural plants and of various agricultural implements. A record was also kept of the atmospheric temperature and other meteorological phenomena. This work was quite systematically performed, largely by Professor Waring personally, and the observations and results duly recorded. Reports were made to the Pennsylvania State Agricultural Society, giving an outline of the work in progress and a few of the most striking results.* Dr. Frear solicited and received from Professor Waring the following letter concerning the experiments of this period:

“The first experimentations were necessarily in the

* (Rpt. Pa. Agr. Soc., Vol. 5, pp. 30, 84, 115, 133, 1859.)

way of tests as to the success of different seeds, fruits, etc., in the high, dry, open location of the college farm, and the working of implements in its clay loam, and the effect of some of the chief elements of manure.

“Sorts of maize, etc., sent us from the lower counties found the season too short. Fruits from the river valleys, or near the lakes or ocean, failed to make healthy growth in most cases, but sorts that had done well west of the Mississippi generally grew and bore well, the aerial conditions seeming to better correspond.

“Many sorts of grains, vegetables and plants or ornamentals were tried in beds, which were allotted to the students, from which many useful deductions were drawn. But the greater part of these failed of useful result, chiefly from the very different kinds of culture given.

“A killing frost in June, 1859, upset all observations as to comparative hardiness in grape vines and fruit trees for that year and the years following, and was a disheartening blow to the student gardeners.

“Lime was applied to certain squares of the orchard in varying quantities. Even extra heavy liming seemed to have a very markedly good effect; ashes (potash) told wherever put; guano caused luxuriance of growth without appearing to increase the quantity of seed in any cereal.

“Part of the plot of wheat, widely drilled, was roughly stirred between the rows in the spring by a coulter tooth. The effect was very conspicuous in the

greater height of straw and seemingly larger heads. There was no time or means then for close observation or punctilious measurements.

“A large collection of trees and plants were set out in arboretum order, but fences were then wanting and the stock (which was also experimented upon in regard to winter feeding, steamed feed, etc.) got the better of the plantings.”

I have attempted faithfully to present such records as are in existence which tell of the man, William G. Waring, of his career as an educator, and particularly of his contribution to the development of The Pennsylvania State College. Much more could be written, for his diary is preserved complete for the years 1856 to 1906; his autobiographical notes are very thorough from his early youth down to 1854, with additional notes written in 1891; and, as an old man, he wrote many interesting accounts of his times under the heading of “Recollections.” It is remembered that he also wrote a manuscript of the origin and development of the Farmers’ High School, but all efforts to find that potentially valuable manuscript have thus far failed.

In my own recollections there is a very vivid picture of him as a very old man, while I was a boy at Tyrone. His “stern, unyielding ways” must have mellowed somewhat, for he was especially fond of children and always kept on hand some hoarhound candy, peppermint or wintergreen lozenges, or other “sweets” to satisfy the youthful appetite. The photograph presented to the School of Agriculture, to be placed in

the Horticultural Building, is most true to life, showing the manner in which he habitually dressed as he walked about the old home orchard, ever on the lookout for some unusual phenomenon in the growth or fruiting of his beloved trees and plants. His diaries abound in notes recording the observations he thus made.

X

THREE EARLY TRUSTEES

AN ACCOUNT of the early agricultural workers of the College and Experiment Station would hardly be complete without mention of a few of the devoted men who not only contributed financially to the founding of the Farmers' High School, but gave largely of their time and influence without compensation. Three of these stand apart as men of vision and of energy, who were sufficiently interested in farming to recognize at that comparatively early date the possibility of a scientific basis for it.

While all of the early trustees were undoubtedly in sympathy with the movement, it was due to the activity of these three, for the most part, that the work was actually put into execution. They were not scientists; and, although all were men of executive and administrative ability, it is on account of their interest in the cause rather than to any scientific ability that they are given place here.

FREDERICK WATTS

May 9, 1801

August 17, 1889

Frederick Watts, a man who probably had more to do than anyone else in establishing the Farmers' High School for Pennsylvania, was born in Carlisle, Penn-



FREDERICK WATTS

From an oil painting in possession of his granddaughters,
the Misses Culbertson.

sylvania, May 9, 1801, the son of David Watts, a distinguished lawyer of that place. His mother's maiden name was Julian Miller, a daughter of General Henry Miller of the Revolution, who also commanded the troops at Baltimore in 1812. The paternal grandfather, Frederick Watts who was born in Wales, came to America in 1760, and was prominent in the affairs of province and state.

David Watts, the father, was a graduate of Dickinson College and read law in Philadelphia. It was said of him that he was "possibly without a superior in the State either on questions of law before the courts, or of facts before the jury." In an article in the Hon. John Blair Linn's "Annals of the Buffalo Valley," George A. Snyder of Lewisburg, characterizes David Watts as follows: "Mr. Watts was a large man with a powerful voice. His self-confidence was great and of great advantage to him, for his abilities were considerable. He contemned authorities, preferring to argue his cause from first principles and this he did with great power. He was apt to be violent and overbearing and was in the habit of heaping abuse upon his opponents. He was a good classical scholar and on that score was susceptible to flattery.....He spent his money with careless profusion.....He was the father of Judge Frederick Watts, a man of talent and industry, and greatly esteemed for his many excellent qualities."

Frederick Watts was graduated from Dickinson College in 1819. During the two years immediately following, he lived with his uncle, William Miles, in

Erie County, and it was while there that he became interested in agricultural affairs. Upon returning to Carlisle he studied law with Andrew Carothers, Esquire, was admitted to the bar in 1824, and immediately formed a partnership with his preceptor. In 1829, with Charles B. Penrose, he became reporter of the decisions of the Supreme Court. They issued three volumes together; then he took over the reporting and issued ten volumes alone. Then in collaboration with Henry J. Sergeant, nine volumes more were issued.

The Reverend Alfred Nevin D.D., LL.D., in "Men of Mark of The Cumberland Valley," published in 1876, says there is "not a single volume of reports of the ninth district in which his name is not found. Excepting three years when on the bench, there is not a report of the Supreme Court of Pennsylvania for forty-two years that does not contain his name as counsel."

In 1849 he was commissioned judge of the ninth judicial district of Pennsylvania, and held the office until 1852 when the position became elective. After retiring from the Bench he formed a law partnership with John Brown Parker, Esquire. The firm transacted an immense legal business until Mr. Parker moved to Philadelphia and Mr. Watts gave up active law practice and retired to one of his farms in 1860.

He was an active old-line Whig during the life of that party and later became a steadfast Republican. He was twice the candidate of his party for judge of his district, but the normal large Democratic majority

in the other counties comprising the judicial district prevented his election.

In 1845 he became President of the Cumberland Valley Railroad in which he had been interested since its organization. This position he held for twenty-six years. It is said that during his presidency the stock of the company advanced from a non-dividend-paying stock selling at two to three dollars, to a ten per cent stock selling at sixty dollars a share. He remained a director until his death. In 1854 he organized the gas and water companies for Carlisle.

Judge Watts was also a member of the Board of control of Dickinson College, active and influential in all its proceedings, from 1823 to 1832 and was Secretary of the Board from 1824 to 1828. He was for many years prominently connected with St. John's Episcopal Church of Carlisle and a leading member of its vestry.

In September, 1827, he married Miss Eliza Cranston of New Castle, Delaware, and three daughters were born to them. His first wife having died, in March, 1835 he was married to Miss Henrietta Edge of Carlisle who, with five sons and one daughter, survived him.

This brief sketch of Judge Watts' life and work is given in order to show the kind of man who may be regarded as the father of The Pennsylvania State College. It is with his work for the cause of agricultural education and experimentation in Pennsylvania that we are directly interested. It is said that on his own farms he "experimented in farm buildings, in ferti-

lizers, in crops, in soils, in agricultural implements, and in various breeds of stocks, and the results were made known to the farming community. He introduced agricultural fairs for the exhibition of everything relating to farms and household use, in order to stimulate farmers and their families to keep abreast of the times."

When the Pennsylvania State Agricultural Society was organized in 1851, Frederick Watts was made its first president. He was also president of the Cumberland County Agricultural Society. From the very first, one of the projects of the State Society seems to have been the establishment of a college for farmers. This is mentioned in a letter of transmittal of the first report of the society to Governor Bigler. At the January meeting in 1853, a resolution was passed authorizing the appointment of a committee to inquire into the expediency of such a school. The committee made a favorable report and gave in detail an estimate of the equipment required and the attendant expense.

As president of the Pennsylvania Agricultural Society Judge Watts was successful in putting through the Legislature in 1854, a charter for the Farmers' High School and again in 1855; the latter was the one under which the school was organized and constructed. The author of the charter was made first president of the Board of Trustees and as such was its prime mover. That he was unselfish in this position is indicated by the fact that the school was located in Centre County, more than a hundred miles from his home, when it might have been located much

nearer. He subscribed liberally to the fund for its establishment and gave of his time not only to attend meetings of the Board in Harrisburg, but also in Bellefonte and on the grounds of the Institution.

Judge Watts' conception of the nature and purpose of the school was given in an address at a public meeting held at the Farmers' High School, September 1, 1858. In it he says in part:

"Its main object is to supply the great want felt by Farmers—a means of obtaining fit education for their sons.....Our school is founded on a scale that will afford complete instruction equal to that of our leading colleges, for should not the education of Farmers' sons be *superior* rather than less than equal to that of any other class?"

In 1871, at 70 years of age, he was appointed United States Commissioner of Agriculture by President Grant and held that office for six years. From a summary published in Bulletin No. 3,—Revised Edition—U. S. Department of Agriculture, Division of Publication, we quote:

"Commissioner Watts found in operation the Divisions of Chemistry, Garden and Grounds, Entomology, Statistics, and Botany.....

"In his first report the Commissioner Recommended that the number of copies of the annual report for gratuitous distribution be greatly reduced, and that the remainder be deposited with the Public Printer for sale at the cost of printing and postage.

"The cultivation of ramie on an extensive scale had been undertaken in the South, and Commissioner

Watts urged that planters should push this industry together with the raising of jute.

“The Division of Microscopy was established in 1871 by the appointment of Thomas Taylor, Microscopist. Early among his services was an investigation of the cranberry rot in New Jersey. He also soon made a study of mushrooms, and suggested the cultivation of them as a profitable business. Other subjects investigated by him were mildews on grapes, yellows in peaches, and black knot on plums.

“Commissioner Watts was the first to give much attention to timber interests. He had sections of the most valuable trees of the country on exhibition at the Centennial Exposition, and in 1877 secured an appropriation for a forestry investigation. Mr. Franklin B. Hough, of Pennsylvania, was appointed special agent in charge of the work. This was the beginning of the Forestry Division which was fully organized several years later.”

The exhibits in the agricultural museum so increased during his administration “that the space allotted to it had to be nearly doubled.”

During his term as Commissioner of Agriculture he resided in Washington and it is said that “the ablest men there soon recognized his ability and sought his companionship and advice.”

Of Judge Watts’ place in his home community, the *Carlisle Daily Herald* of August 19, 1879, said:

“Certainly no man ever held a position in Cumberland County at all comparable with that Mr. Watts filled. Of all the noted men of the valley he was the

foremost in power, ability, and his hold upon the people, who, from the mingling of Scotch Irish blood among them, possess to an exceptional degree individuality of character. Among such people Mr. Watts was 'facile princeps.' Leadership among such a people was due to him. It was due to his integrity, to his innate nobility of character, to his preeminent ability, to his hatred of wrong and to his sense of justice. For more than half a century it was cheerfully accorded to him, and there never was an approach made to any attempt to deprive him of it. People had unlimited confidence in him and he never abused it. His simple word had the sanctity of an oath with them, and the accusation of enemies and of the envious only emphasized the towering probity of his character.

"Powerful in physique, dignified and courteous in manner, clear, concise and earnest in speech, he impressed himself upon all who came in contact with him." Moreover, he was virtually worshiped by his family.

In a letter to the author, Mrs. Samuel B. Johnston, his youngest daughter says she has "heard his older sister say that as a young man, he was the handsomest man she had ever seen. At eighty-nine, his mind was clear, his faculties good. He was simply worn out and went quietly to sleep without an illness."

The Reverend Mr. Nevin says of him that "his most prominent characteristics were force and abiding self-confidence. What he believed, he believed implicitly. He was a man of perfect equanimity and al-

ways had his temper in perfect control. That he was the most prominent citizen of the community in which he lived for more than a quarter of a century is not questioned."



HUGH NELSON McALLISTER

HUGH NELSON McALLISTER

June 28, 1808

May 15, 1873

Hugh Nelson McAllister was a lawyer of Bellefonte. He was born in Lost Creek Valley, Juniata County, June 28, 1809, and was the son of Hon. William and Sara (Thompson) McAllister. He was reared on his father's farm, which had also been his grandfather's, received such elementary education as the neighboring schools afforded, and was prepared for college by a private tutor, the Reverend John Hutchinson. Young McAllister entered Jefferson College, Canonsburg, Pennsylvania in 1830 where he was graduated three years later standing high in a class of exceptional scholarship. Immediately after graduation he entered the law office of Hon. W. W. Potter of Bellefonte and was admitted to the Bar in 1835. He then entered into a partnership with his preceptor which continued during the latter's life. In 1859 Attorney McAllister formed a partnership with a pupil of his, James A. Beaver, who later became his son-in-law and, afterwards, governor of the state. At the beginning of the Civil War McAllister tendered his services and was elected captain of Company F, 232d Regiment, of the Pennsylvania Militia, and held this position until a younger man was found to take his place.

The standing of Hugh McAllister as a lawyer was

such that Governor Bigler offered to appoint him president judge of his district, which office he declined. The position was also tendered to him twice by Governor Curtin, but he continued to decline. At the close of the war he was one of the commissioners appointed by the Governor to adjust the claims of citizens of the border counties sustained on account of the war.

He was elected delegate at large to the constitutional convention of 1873 and was appointed chairman of the Committees on Suffrage, Election, and Representation, and was also a member of the Committee on Railroads and Canals. His death occurred while he was serving on the commission, May 15, 1873.

In "Industry and Institutes of Centre County," D. S. Maynard, in 1877 said:

"To the Hon. Frederick Watts of Carlisle, and the Hon. H. N. McAllister, Esq., of Bellefonte, this College owes its inception. These gentlemen, first in a casual conversation and afterwards in a more serious one, discussed the idea of establishing a school in this State for the education of the sons of farmers. They had observed that Farmers' sons seemed to be unfitted by the literary colleges of the land for the occupation of their fathers, and they hoped and believed that a system of special education in agricultural science and practice would correct this evil and meet a very urgent want of the agricultural interests of the State. They accordingly drew up a charter establishing the Farmers' High School of Pennsylvania, and suc-

ceeded in having it passed by the Legislature. It was signed by the Governor in April, 1854.”*

As a citizen McAllister was said to have been public spirited and patriotic. He labored for and contributed to every enterprise designed to promote the public good. As one of the projectors of the Farmers' High School he was active in the affairs of the College until his death. He was a leader in church, in education in general, and was one of the most active supporters of the temperance cause in the country. He married Miss Henrietta Ashman Orviston of Huntingdon County. They had seven children, only two of whom, however, lived to maturity. One became the wife of General Beaver, the other, the wife of Dr. James R. Hayes. Mr. McAllister's first wife died April 12, 1857, and on September 12, 1859, he married Miss Margaret Hamilton, a daughter of Hugh Hamilton of Harrisburg and a cousin of Professor John Hamilton.

As an evidence of McAllister's interest in agriculture, it is said, “He kept the County Agricultural Society in existence for years almost unaided.”

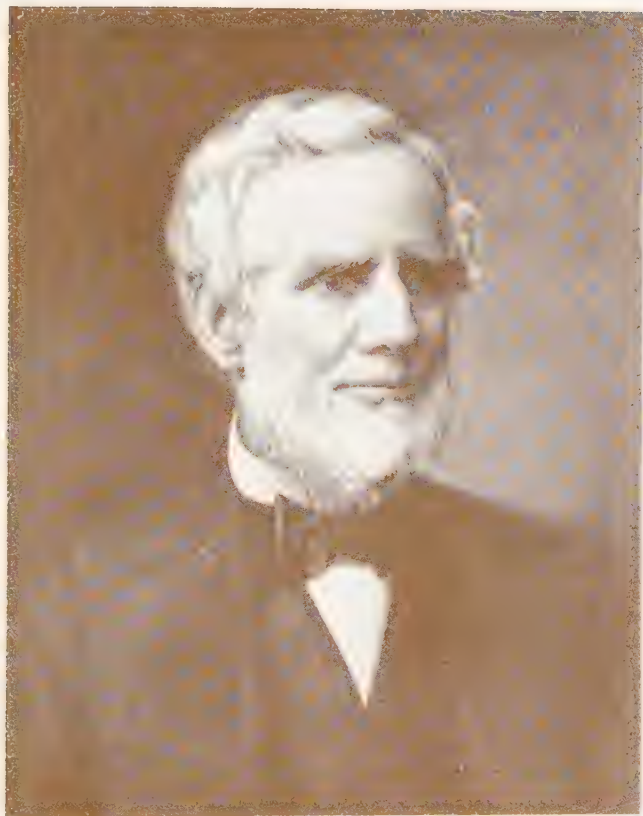
* This charter was found defective and work had to be deferred until a new one could be obtained in 1855.

MOSES THOMPSON

March 25, 1810

June 16, 1891

Moses Thompson was the second son of General John and Elizabeth (McFarland) Thompson. He was born in a "little old log house," with a puncheon floor, near Oak Hall, March 25, 1810. His mother died when he was 12 years old and his father 10 years later. "At the age of 19 or 20 he assumed the responsibility of the farm, thus relieving his father from care. One of his first acts was to banish liquor from the place, notwithstanding the fact that it was universally used, especially at harvest time." In 1838 he married Miss Mary Irvin, a daughter of John and Anna (Watson) Irvin. He continued to manage the home farm until 1839, when he left it to his brothers and moved to a farm of his own which he had purchased and on which he resided for three years. April 1, 1842, he moved to Centre Furnace, having bought a sixth interest in that property and the Milesburg Iron Works from General James Irvin, his brother-in-law. In 1848 in company with his brother, William Thompson, he purchased of William Irvin, another brother-in-law, a sixth interest in the same works. A few years later he bought his brother's interest and thus became owner of one-third of both properties. In 1864 he bought one-half of John



MOSES THOMPSON

Irvin's interest, the other half being sold to Dr. J. M. McCoy and James H. Linn. In 1865 he sold his half interest in the Milesburg Iron Works to McCoy and Linn and bought their interest in Centre Furnace which made him sole owner of that property. At the time of his death he was the largest land owner of Centre County. One of his estates contained 6,000 acres in a single body.

Mr. Thompson was interested in many other projects besides the iron business. He subscribed largely to the stock of the Bald Eagle Valley Canal, the Bald Eagle Valley Railroad, the Boalsburg and Bellefonte Turnpike, the Agricultural College and Junction Turnpike, and the Lewisburg, Centre and Spruce Creek Railroad.

Moses Thompson succeeded Edward C. Humes of Bellefonte, as treasurer of The Pennsylvania State College, about 1860, and served for many years, or until 1874, and assisted greatly in establishing the school upon a firm basis. Prior to that time he served as secretary of the Board. With his cousin, Robert McFarland, he established a bank at Centre Furnace in 1866 and this firm furnished the stock and implements for the Central Experimental and Model Farm. The bank was later moved to Lemont and continued for a few years under the name of John I. Thompson and Company.

Mr. Thompson was a man of unusually robust physique, six feet tall, weighed about 200 pounds, and is said to have been "straight as an arrow." He died, in 1891, at the age of 81. He had eight children,

six of whom reached maturity. His second daughter, Elizabeth McFarland, became the wife of Professor John Hamilton. His oldest son, John I. Thompson, was bookkeeper of the College for several years and succeeded Professor Hamilton as treasurer.

As an evidence of the hospitality of the Moses Thompson home, which is also said to be characteristic of the homes of most of the old ironmasters, we may quote from Hon. John Blair Linn's History of Centre County.

"On the 20th of June, 1855, a committee of the trustees of the Farmer's High School, consisting of Governor Pollock, Hon. Frederick Watts, and Dr. A. L. Elwyn, and others visited Centre County for the purpose of examining the farms offered by General Irvin. General Irvin offered them the choice of three farms. After the farms were examined, the trustees and all the company repaired to the dwelling-house of Moses Thompson at Centre Furnace, where one hundred and fifty persons were entertained by a sumptuous dinner prepared by Mrs. Thompson."

On September 12, the board selected the farm offered by General Irvin lying about a mile west of Center Furnace. From that time until his death Mr. Thompson was actively interested in the development of the school, as secretary of the Board, as treasurer, as a member of the building committee and in various other capacities.

THE AUTHOR'S TRIBUTE

In the preceding pages we have endeavored to record some of what seems to have been significant events in the lives of a few of the men who were most prominent in developing the plan and shaping the policy of the agricultural growth of The Pennsylvania State College. We have also made an effort to present some of the prominent characteristics that governed these men in their relations with the College. The writer has felt that he was in part repaying a debt of gratitude owed to friends who had often been counsellors to him.

That these men may have had qualities less desirable than those presented is not denied, but the less desirable qualities were not the ones that led to the success of their possessors and are, therefore, of no significance in sketches such as these. Sincerity, diligence, and fidelity seem to have been dominating qualities in these pioneers. Most of them were also men of pronounced strength. The amount of work done by some of these men, unhampered by the advice of "efficiency experts" might lead us rightly to conclude with the pentateuchal writer: "There were giants in the earth in those days."

CHINESE

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